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(54) Title: NUCLEIC ACIDS, PROTEINS, AND ANTIBODIES

(57) Abstract: The present invention relates to novel nervous system related polynucleotides and the polypeptides encoded by these polynucleotides herein collectively known as "nervous system antigens", and the use of such nervous system antigens for detecting disorders of the nervous system, particularly the presence of cancers of the nervous system and nervous system cancer metastases. More specifically, isolated nervous system associated nucleic acid molecules are provided encoding novel nervous system associated polypeptides. Novel nervous system polypeptides and antibodies that bind to these polypeptides are provided. Also provided are vectors, host cells, and recombinant and synthetic methods for producing human nervous system associated polynucleotides and/or polypeptides. The invention further relates to diagnostic and therapeutic methods useful for diagnosing, treating, preventing and/or prognosing disorders related to the nervous system, including cancers of the nervous system, and therapeutic methods for treating such disorders. The invention further relates to screening methods for identifying agonists and antagonists of polynucleotides and polypeptides of the invention. The present invention further relates to methods and/or compositions for inhibiting the production and function of the polypeptides of the present invention.

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Nucleic Acids, Proteins, and Antibodies

[001] This application refers to a "Sequence Listing" that is provided only on electronic media in computer readable form pursuant to Administrative Instructions Section 801(a)(i). The Sequence Listing forms a part of this description pursuant to Rule 5.2 and Administrative Instructions Sections 801 to 806, and is hereby incorporated in its entirety.

[002] The Sequence Listing is provided as an electronic file (PC010PCT_seqList.txt, 23,109,132 bytes in size, created on January 12, 2001) on four identical compact discs (CD-R), labeled "COPY 1," "COPY 2," "COPY 3," and "CRF." The Sequence Listing complies with Annex C of the Administrative Instructions, and may be viewed, for example, on an IBM-PC machine running the MS-Windows operating system by using the V viewer software, version 2000 (see World Wide Web URL: <http://www.fileviewer.com>).

Field of the Invention

[003] The present invention relates to novel nervous system related polynucleotides, the polypeptides encoded by these polynucleotides herein collectively referred to as "nervous system antigens," and antibodies that immunospecifically bind these polypeptides, and the use of such nervous system polynucleotides, antigens, and antibodies for detecting, treating, preventing and/or prognosing disorders of the nervous system, including, but not limited to, the presence of cancers of the nervous system and metastases of nervous system cancers. More specifically, isolated nervous system nucleic acid molecules are provided encoding novel nervous system polypeptides. Novel nervous system polypeptides and antibodies that bind to these polypeptides are provided. Also provided are vectors, host cells, and recombinant and synthetic methods for producing human nervous system polynucleotides, polypeptides, and/or antibodies. The invention further relates to diagnostic and therapeutic methods

useful for diagnosing, treating, preventing and/or prognosing disorders related to the nervous system, including cancers of the nervous system, and therapeutic methods for treating such disorders. The invention further relates to screening methods for identifying agonists and antagonists of polynucleotides and polypeptides of the invention. The invention further relates to methods and/or compositions for inhibiting or promoting the production and/or function of the polypeptides of the invention.

Background of the Invention

[004] The brain is the control center of the body, encoding such functions as the ability to move, touch, taste, smell, hear, and see, for example. It reviews all stimuli, whether from internal organs or the surface of the body, and generates a reaction, such as movement of the limbs, adjustment of the rate at which internal organs function, and/or alteration of mood. Stimuli and reactions are transmitted to and from the brain via the spinal cord, a collection of nerves encased within bony vertebrae. Both the brain and spinal cord are wrapped in three layers of tissue, collectively called the meninges, which provide cushioning and protection. Together, these components make up the central nervous system (CNS).

[005] The human brain is subdivided into three major segments: the brain stem, midbrain, and forebrain. The brain stem is considered to be the seat of the "primitive brain". It comprises such structures as the medulla and cerebellum, which control basic functions like breathing, heart rate, and digestion and the coordination of the senses and muscle movement, respectively. Many of these features are homologous across species. The midbrain controls many sensory and motor functions, including eye movement, and links the brain stem to such structures as the thalamus (for information relay) and hypothalamus (which is instrumental in regulating autonomic functions, like maintaining body temperature, regulating water balance, and controlling sleep). The forebrain is associated with the "high-level" functions of complex organisms. This area includes specialized regions for the control of skilled motor behaviors (e.g., speech, mood, thought, and planning for the future), interpretation of sensory input from the rest of the body, control of voluntary body movements, interpretation of vision, retrieval of long-term memories, recognition of familiar objects, and initiation of communication or action.

[006] Despite being encapsulated in the thick, hard bones of the skull, the brain is susceptible to many kinds of injury. Common injuries resulting from head trauma include herniation, edema, hematomas (subdural and epidural), amnesia, coma, stupor, delirium, persistent or chronic vegetative state, concussion and post-concussion syndrome, cerebral contusions, damage to specific brain areas (e.g., the aphasia, apraxia, agnosia, and amnesia), and posttraumatic epilepsy. Bacteria and other infectious organisms can reach the CNS in through the blood stream or by penetration through an injury or surgery wound, leading to several serious diseases, such as bacterial meningitis, Waterhouse-Friderichsen syndrome, chronic meningitis, viral meningitis (e.g., lymphocytic choriomeningitis), bacterial meningitis (e.g., Haemophilus, Listeria, Meningococcal, pneumococcal, or meningeal tuberculosis), encephalitis, encephalomyelitis, Hallervorden-Spatz syndrome, aseptic meningitis, parainfectious encephalitis, subacute sclerosing panencephalitis, brain abscesses, AIDS dementia complex, Japanese encephalitis, St. Louis encephalitis, Tick-borne encephalitis, West Nile Fever encephalitis, postencephalitic Parkinson disease, necrotizing hemorrhagic encephalomyelitis, visna, cerebral malaria, neurosyphilis (e.g., tabes dorsalis), subdural empyema, cysticercosis, schistosomiasis, echinococcosis, coenurosis, cerebral toxoplasmosis, and prion diseases (e.g., Creutzfeldt-Jakob syndrome, bovine spongiform encephalopathy, Gerstmann-Straussler syndrome, kuru, or scrapie). Other brain diseases include hydrocephalus (e.g., Dandy-Walker syndrome or normal pressure hydrocephalus), Rhett syndrome, Reye's syndrome, pseudotumor cerebri, intracranial tuberculoma, Zellweger syndrome, narcolepsy, cataplexy, and cerebellar diseases. The spinal cord is equally susceptible to injury and disease, which can result in cervical spondylosis, cysts, acute transverse myelitis, spinal hematoma, nerve root disorders (e.g., sciatica, spinal stenosis, and shingles), ruptured disk, and spinal cord compression. Together, this illustrates the relative frailty of the CNS.

[007] The peripheral nervous system (PNS) includes all nerves outside the CNS: the cranial nerves that connect the head and face directly to the brain, the nerves that connect the eyes and nose to the brain, and all the nerves that connect the spinal cord to the rest of the body. The brain communicates with much of the body through the thirty-one pairs of spinal nerves that emerge from the spinal cord. Each pair includes one nerve at the front of the spinal cord, which carries information from the brain to

the muscles, and one nerve located at the back of the spinal cord, which carries sensory information to the brain. Peripheral nerves are actually bundles of nerve fibers – some of which are very small (less than 1/64 of an inch in diameter) and others are quite large. Large fibers convey the messages that activate muscles (motor nerves) and the sensations of touch and position (sensory nerves), whereas small fibers convey sensations of pain and temperature and control the automatic functions of the body, such as heart rate and blood pressure (autonomic nerves).

[008] Like the CNS, damage to the PNS results in several known disease states with effects seen throughout the body. Disorders of muscle stimulation include amyotrophic lateral sclerosis, progressive muscular atrophy, progressive bulbar palsy, Werdnig-Hoffman disease, intermediate spinal muscular atrophy, infantile and juvenile muscular atrophy, poliomyelitis and the post polio syndrome, primary lateral sclerosis, Wohlfart-Kugelberg-Welander disease, and progressive pseudobulbar palsy. Malfunction of the cranial nerves that lead directly from the brain to various parts of the head also results in several known disorders, such as trigeminal neuralgia, glossopharyngeal neuralgia, and Bell's palsy. Other diseases of the PNS include plexus disorders (e.g., acute brachial neuritis), thoracic outlet syndromes, mononeuropathy (e.g., carpal tunnel syndrome, leprosy, ulnar nerve palsy, radial nerve palsy, and peroneal nerve palsy), multiple mononeuropathy, polyneuropathy (e.g., chronic polyneuropathy and diabetic neuropathy), Guillain-Barre syndrome, and hereditary neuropathies (e.g., Charcot-Marie-Tooth disease and Dejerine-Sottas disease).

[009] Nerve cells are the fundamental elements of both the CNS and PNS. In total, there are an estimated 100 billion neurons in a human body. While neurons are similar to other cells of the body in their general organization, they also possess highly specialized and unique features which are critical to the function of the nervous system. Each neuron is comprised of four distinct regions: the cell body, a single axon, dendrites, and axon terminals. The cell body contains the nucleus and other organelles necessary for the life and functioning of the neuron. The dendrites are processes that extend outward from the cell body and receive signals from sensory organs or from other neurons. In the dendrites, incoming signals are converted to electrical impulses and transmitted to the cell body for processing. A single axon

extends from the cell body, which conducts information from the cell body to organs, muscles, or other neurons. At the end of the axon is an array of axon termini. These termini are the transmitting elements of a neuron. By means of these termini, an axon is able to transmit information to the receptive surfaces (typically the dendrites or the cell body) of other neurons or muscle cells.

[010] Other cellular structures crucial for neural transmission are the cytoskeletal fibers, including microtubules and neurofilaments, which run the length of the axon and function in transporting proteins, vesicles, and other macromolecules to the axon terminal. Additionally, some axons are surrounded by a myelin sheath made up of membranes from either oligodendrocyte cells (CNS) or Schwann cells (PNS). Myelinated axons conduct electrical impulses faster than unmyelinated ones of the same diameter. Damage to the myelin sheath has been associated with several known disease states, including multiple sclerosis, acute disseminated encephalomyelitis, Canavan disease, diffuse cerebral sclerosis, encephalitis periaxialis, global cell leukodystrophy, metachromatic leukodystrophy, allergic encephalomyelitis, necrotizing hemorrhagic encephalomyelitis, progressive multifocal leukoencephalopathy, central pontine myelinolysis, transverse myelinolysis, neuromyelitis optica, scrapie, swayback, adrenoleukodystrophy, adrenomyeloneuropathy, Leber's hereditary optic atrophy, and HTLV-associated myelopathy.

[011] Contact between neurons occurs at a specialized site called a synapse. At this site, the axon terminal from one neuron (the presynaptic cell) sends a signal to another neuron (the postsynaptic cell). Synapses may be connected either electrically or chemically. An electrical synapse consists of gap junctions that directly connect two neurons. This allows electrical signals to pass unabated from the presynaptic to postsynaptic neuron.

[012] The electrical signals are produced by temporary changes in the current flow into and out of the cell. Ion channels embedded in the membrane regulate current flow by selectively regulating the passage of a specific ion or ions across the membrane. There are two types of ion channels found in neural membranes – gated and non-gated. Non-gated channels are always open and are not significantly influenced by changes in external factors. These ion channels primarily function in maintaining the resting

membrane potential, or electrical potential across the membrane, of the neuron. Gated channels, in contrast, exist in two stable conformations – open and closed. Most gated channels are closed when the membrane is at its resting potential, and open when stimulated by external factors such as a change in membrane potential, ligand binding, or membrane stretch. Agonists, antagonists, and antibodies that bind to or block ion channels are extremely useful tools for studying brain function, which could lead to significant advances in understanding disease and the development of therapies. For example, tetrodotoxin (TTX), isolated from the poison sacks of the puffer fish, selectively blocks the voltage-gated sodium channels necessary for producing an excitatory electrical potential. This provides the researcher with a powerful tool for studying the effects of activity blockade on such processes as neural network development, learning and memory.

[013] In chemical synapses, the axon termini of the presynaptic cell contain vesicles filled with a particular molecule (neurotransmitter). An electrical signal from the cell body travels down the axon to the axon termini, where it triggers the release of neurotransmitter from the vesicle by exocytosis. The neurotransmitter rapidly diffuses across the synaptic cleft separating the presynaptic from the postsynaptic neuron. The neurotransmitter then binds to receptors located on the dendrites of the postsynaptic neuron, which open ion channels and provokes a change in the cell's electric potential. This change in electrical potential prompts further transmission of the signal.

[014] Signal transmission between a neuron and muscle cell occurs via a similar mechanism. At the neuromuscular junction, axon termini reside adjacent to muscle cells within depressions formed in the motor end-plate. An electrical signal prompts the release of neurotransmitter from axon termini, which diffuses across the synaptic cleft and binds to receptors located on the surface of the muscle cell. Binding of neurotransmitter provokes an electrical response that stimulates contraction of the muscle. Dysfunction of the neuromuscular junction plays a role in several neurological disorders. For example, in myasthenia gravis the immune system produces antibodies that attack the neurotransmitter receptors located on the muscle, preventing neurotransmitter binding and muscle contraction. Additionally, these antibodies can also be transferred from mother to child through the placenta, resulting in a variation of the disease called neonatal myasthenia, whose symptoms typically

disappear shortly after birth. Other known neuromuscular junction disorders include Eaton-Lambert syndrome and botulism.

- [015] Neurotransmitters comprise a diverse group of small molecules, such as L-glutamine and acetylcholine, or peptides like enkephalin (McCance and Huenther, Pathophysiology, the Biological Basis for Disease in Adults and Humans, 2nd edition, pp.403-404 (1994)). Neurotransmitters are synthesized within the cell body of the presynaptic neuron and transported to the axon termini in vesicles, where they reside until exocytosed. The effects of neurotransmitters can be excitatory (e.g initiation of neuron stimulation) or inhibitory (e.g., to hyperpolarize the plasma membrane and inhibit signal transmission). Many neurotransmitters are capable of eliciting either an excitatory or inhibitory response, dependent on the number and type of receptors located on the postsynaptic neuron.
- [016] Current medical research efforts have identified a role for neurotransmitters and their receptors as targets of pharmacological agents aimed at controlling neurological function. For example, sedatives, such as benzodiazepines and barbituates, mimic the effect of the neurotransmitter GABA, which is known to be the primary inhibitory neurotransmitter in the CNS (Katzung, Basic and Clinical Pharmacology, 6th edition, 338-339 (1995)). The aberrant activity of neurotransmitters and their receptors has been linked to a number of neurological disorders, including Alzheimer's disease, Parkinson's disease, epilepsy, stroke, and myasthenia gravis (Planells-Cases et al., PNAS 90: 5057-5061 (1993)), identifying an important need for the discovery of novel polypeptides, agonists, antagonists, and corresponding to neurotransmitters.
- [017] In adult humans, each neuron is connected to approximately ten thousand other neurons (Tessier-Lavigne et al., Science 274: 1123-1133 (1996)). While the overall program for determining which neurons should be connected together is under genetic control, it is external stimuli from sensory neurons that are crucially important in determining what network connections are actually made. To clarify, precise neural wiring is not fully developed at birth, but only roughly approximates the final network required to be fully functional. During embryonic development, neural connections are initiated via the programmed extension of axons, tipped at the leading end with a growth cone that is guided by molecular cues. Throughout post-natal development, this coarse pattern of connections is refined based on specific interactions between the

organism and its environment – essentially, through learning. This process can be modulated by normal and aberrant experiences, both having a more profound effect during early stages of postnatal development than in adulthood.

[018] Several changes occur in the brain throughout aging. Gross changes include decreases in brain weight, the production of certain proteins, and the total number of neurons in many brain regions. Additionally, there are age-related alterations in the synthesis and degradation of neurotransmitters and their receptors that are believed to cause some of the characteristics of senescence: changes in sleep patterns, mood, appetite, neuroendocrine functions, motor activity, and memory. While these changes are considered normal, a number of diseases have been identified that result from aberrant age-related changes, such as Alzheimer's disease, Parkinson's disease, Huntington's disease, Pick's disease, and dementia.

[019] The discovery of new human nervous system associated polynucleotides, the polypeptides encoded by them, and antibodies that immunospecifically bind these polypeptides, satisfies a need in the art by providing new compositions which are useful in the diagnosis, treatment, prevention and/or prognosis of disorders of the nervous system, including, but not limited to, neuropsychiatric disorders, neurodegenerative diseases, vascular disorders, developmental disorders, infections, and neoplastic disorders.

Summary of the Invention

[020] The present invention relates to novel nervous system related polynucleotides, the polypeptides encoded by these polynucleotides herein collectively referred to as "nervous system antigens," and antibodies that immunospecifically bind these polypeptides, and the use of such nervous system polynucleotides, antigens, and antibodies for detecting, treating, preventing and/or prognosing disorders of the nervous system, including, but not limited to, the presence of cancers of the nervous system and metastases of cancers of the nervous system. More specifically, isolated nervous system nucleic acid molecules are provided encoding novel nervous system polypeptides. Novel nervous system polypeptides and antibodies that bind to these

polypeptides are provided. Also provided are vectors, host cells, and recombinant and synthetic methods for producing human nervous system polynucleotides, polypeptides, and/or antibodies. The invention further relates to diagnostic and therapeutic methods useful for diagnosing, treating, preventing and/or prognosing disorders related to the nervous system, including cancers of the nervous system, and therapeutic methods for treating such disorders. The invention further relates to screening methods for identifying agonists and antagonists of polynucleotides and polypeptides of the invention. The invention further relates to methods and/or compositions for inhibiting or promoting the production and/or function of the polypeptides of the invention.

Detailed Description

Tables

[021] Table 1A summarizes some of the polynucleotides encompassed by the invention (including cDNA clones related to the sequences (Clone ID NO:Z), contig sequences (contig identifier (Contig ID:) and contig nucleotide sequence identifier (SEQ ID NO:X)) and further summarizes certain characteristics of these polynucleotides and the polypeptides encoded thereby. The first column provides a unique clone identifier, "Clone ID NO:Z", for a cDNA plasmid related to each nervous system associated contig sequence disclosed in Table 1A. The second column provides a unique contig identifier, "Contig ID:" for each of the contig sequences disclosed in Table 1A. The third column provides the sequence identifier, "SEQ ID NO:X", for each of the contig polynucleotide sequences disclosed in Table 1A. The fourth column, "ORF (From-To)", provides the location (i.e., nucleotide position numbers) within the polynucleotide sequence of SEQ ID NO:X that delineate the preferred open reading frame (ORF) shown in the sequence listing and referenced in Table 1A as SEQ ID NO:Y (column 5). Column 6 lists residues comprising predicted epitopes contained in the polypeptides encoded by each of the preferred ORFs (SEQ ID NO:Y). Identification of potential immunogenic regions was performed according to the method of Jameson and Wolf (CABIOS, 4:181-186 (1988)); specifically, the Genetics Computer Group (GCG) implementation of this algorithm, embodied in the program PEPTIDESTRUCTURE (Wisconsin Package v10.0, Genetics Computer Group (GCG), Madison, Wisc.). This method returns a measure of the probability that a given

residue is found on the surface of the protein. Regions where the antigenic index score is greater than 0.9 over at least 6 amino acids are indicated in Table 1A as "Predicted Epitopes." In particular embodiments, nervous system associated polypeptides of the invention comprise, or alternatively consist of, one, two, three, four, five or more of the predicted epitopes described in Table 1A. It will be appreciated that depending on the analytical criteria used to predict antigenic determinants, the exact address of the determinant may vary slightly. Column 7, "Tissue Distribution" shows the expression profile of tissue, cells, and/or cell line libraries which express the polynucleotides of the invention. The first number in column 7 (preceding the colon), represents the tissue/cell source identifier code corresponding to the code and description provided in Table 4. Expression of these polynucleotides was not observed in the other tissues and/or cell libraries tested. For those identifier codes in which the first two letters are not "AR", the second number in column 7 (following the colon), represents the number of times a sequence corresponding to the reference polynucleotide sequence (e.g., SEQ ID NO:X) was identified in the tissue/cell source. Those tissue/cell source identifier codes in which the first two letters are "AR" designate information generated using DNA array technology. Utilizing this technology, cDNAs were amplified by PCR and then transferred, in duplicate, onto the array. Gene expression was assayed through hybridization of first strand cDNA probes to the DNA array. cDNA probes were generated from total RNA extracted from a variety of different tissues and cell lines. Probe synthesis was performed in the presence of ^{33}P dCTP, using oligo(dT) to prime reverse transcription. After hybridization, high stringency washing conditions were employed to remove non-specific hybrids from the array. The remaining signal, emanating from each gene target, was measured using a Phosphorimager. Gene expression was reported as Phosphor Stimulating Luminescence (PSL) which reflects the level of phosphor signal generated from the probe hybridized to each of the gene targets represented on the array. A local background signal subtraction was performed before the total signal generated from each array was used to normalize gene expression between the different hybridizations. The value presented after "[array code]:" represents the mean of the duplicate values, following background subtraction and probe normalization. One of skill in the art could routinely use this information to identify normal and/or diseased

tissue(s) which show a predominant expression pattern of the corresponding polynucleotide of the invention or to identify polynucleotides which show predominant and/or specific tissue and/or cell expression. Column 8, "Cytologic Band," provides the chromosomal location of polynucleotides corresponding to SEQ ID NO:X. Chromosomal location was determined by finding exact matches to EST and cDNA sequences contained in the NCBI (National Center for Biotechnology Information) UniGene database. Given a presumptive chromosomal location, disease locus association was determined by comparison with the Morbid Map, derived from Online Mendelian Inheritance in Man (Online Mendelian Inheritance in Man, OMIM™. McKusick-Nathans Institute for Genetic Medicine, Johns Hopkins University (Baltimore, MD) and National Center for Biotechnology Information, National Library of Medicine (Bethesda, MD) 2000. World Wide Web URL: <http://www.ncbi.nlm.nih.gov/omim/>). If the putative chromosomal location of the Query overlapped with the chromosomal location of a Morbid Map entry, an OMIM identification number is provided in Table 1A, column 9 labeled "OMIM Disease Reference(s)". A key to the OMIM reference identification numbers is provided in Table 5.

[022] Table 1B summarizes additional polynucleotides encompassed by the invention (including cDNA clones related to the sequences (Clone ID NO:Z), contig sequences (contig identifier (Contig ID:) contig nucleotide sequence identifiers (SEQ ID NO:X)), and genomic sequences (SEQ ID NO:B). The first column provides a unique clone identifier, "Clone ID NO:Z", for a cDNA clone related to each contig sequence. The second column provides the sequence identifier, "SEQ ID NO:X", for each contig sequence. The third column provides a unique contig identifier, "Contig ID:" for each contig sequence. The fourth column, provides a BAC identifier "BAC ID NO:A" for the BAC clone referenced in the corresponding row of the table. The fifth column provides the nucleotide sequence identifier, "SEQ ID NO:B" for a fragment of the BAC clone identified in column four of the corresponding row of the table. The sixth column, "Exon From-To", provides the location (i.e., nucleotide position numbers) within the polynucleotide sequence of SEQ ID NO:B which delineate certain polynucleotides of the invention that are also exemplary members of polynucleotide sequences that encode polypeptides of the invention (e.g., polypeptides containing

amino acid sequences encoded by the polynucleotide sequences delineated in column six, and fragments and variants thereof).

[023] Table 2 summarizes homology and features of some of the polypeptides of the invention. The first column provides a unique clone identifier, "Clone ID NO:Z", corresponding to a cDNA disclosed in Table 1A. The second column provides the unique contig identifier, "Contig ID:" corresponding to contigs in Table 1A and allowing for correlation with the information in Table 1A. The third column provides the sequence identifier, "SEQ ID NO:X", for the contig polynucleotide sequences. The fourth column provides the analysis method by which the homology/identity disclosed in the row was determined. Comparisons were made between polypeptides encoded by the polynucleotides of the invention and either a non-redundant protein database (herein referred to as "NR"), or a database of protein families (herein referred to as "PFAM") as further described below. The fifth column provides a description of PFAM/NR hits having significant matches to a polypeptide of the invention. Column six provides the accession number of the PFAM/NR hit disclosed in the fifth column. Column seven, "Score/Percent Identity", provides a quality score or the percent identity, of the hit disclosed in column five. Columns 8 and 9, "NT From" and "NT To" respectively, delineate the polynucleotides in "SEQ ID NO:X" that encode a polypeptide having a significant match to the PFAM/NR database as disclosed in the fifth column. In specific embodiments, polypeptides of the invention comprise, or alternatively consist of, an amino acid sequence encoded by the polynucleotides in SEQ ID NO:X as delineated in columns 8 and 9, or fragments or variants thereof.

[024] Table 3 provides polynucleotide sequences that may be disclaimed according to certain embodiments of the invention. The first column provides a unique clone identifier, "Clone ID NO:Z", for a cDNA clone related to nervous system associated contig sequences disclosed in Table 1A. The second column provides the sequence identifier, "SEQ ID NO:X", for contig polynucleotide sequences disclosed in Table 1A. The third column provides the unique contig identifier, "Contig ID", for contigs disclosed in Table 1A. The fourth column provides a unique integer 'a' where 'a' is any integer between 1 and the final nucleotide minus 15 of SEQ ID NO:X, represented as "Range of a", and the fifth column provides a unique integer 'b' where 'b' is any integer between 15 and the final nucleotide of SEQ ID NO:X, represented as "Range

of b", where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:X, and where b is greater than or equal to a + 14. For each of the polynucleotides shown as SEQ ID NO:X, the uniquely defined integers can be substituted into the general formula of a-b, and used to describe polynucleotides which may be preferably excluded from the invention. In certain embodiments, preferably excluded from the polynucleotides of the invention (including polynucleotide fragments and variants as described herein and diagnostic and/or therapeutic uses based on these polynucleotides) are at least one, two, three, four, five, ten, or more of the polynucleotide sequence(s) having the accession number(s) disclosed in the sixth column of this Table (including for example, published sequence in connection with a particular BAC clone). In further embodiments, preferably excluded from the invention are the specific polynucleotide sequence(s) contained in the clones corresponding to at least one, two, three, four, five, ten, or more of the available material having the accession numbers identified in the sixth column of this Table (including for example, the actual sequence contained in an identified BAC clone).

[025] Table 4 provides a key to the tissue/cell source identifier code disclosed in Table 1A, column 7. Column 1 provides the key to the tissue/cell source identifier code disclosed in Table 1A, Column 7. Columns 2-5 provide a description of the tissue or cell source. Codes corresponding to diseased tissues are indicated in column 6 with the word "disease". The use of the word "disease" in column 6 is non-limiting. The tissue or cell source may be specific (e.g. a neoplasm), or may be disease-associated (e.g., a tissue sample from a normal portion of a diseased organ). Furthermore, tissues and/or cells lacking the "disease" designation may still be derived from sources directly or indirectly involved in a disease state or disorder, and therefore may have a further utility in that disease state or disorder. In numerous cases where the tissue/cell source is a library, column 7 identifies the vector used to generate the library.

[026] Table 5 provides a key to the OMIM™ reference identification numbers disclosed in Table 1A, column 9. OMIM reference identification numbers (Column 1) were derived from Online Mendelian Inheritance in Man (Online Mendelian Inheritance in Man, OMIM™. McKusick-Nathans Institute for Genetic Medicine, Johns Hopkins University (Baltimore, MD) and National Center for Biotechnology Information, National Library of Medicine, (Bethesda, MD) 2000. World Wide Web URL:

<http://www.ncbi.nlm.nih.gov/omim/>). Column 2 provides diseases associated with the cytologic band disclosed in Table 1A, column 8, as determined from the Morbid Map database.

[027] Table 6 summarizes ATCC Deposits, Deposit dates, and ATCC designation numbers of deposits made with the ATCC in connection with the present application.

[028] Table 7 shows the cDNA libraries sequenced, tissue source description, vector information and ATCC designation numbers relating to these cDNA libraries.

[029] Table 8 provides a physical characterization of clones encompassed by the invention. The first column provides the unique clone identifier, "Clone ID NO:Z", for certain cDNA clones of the invention, as described in Table 1A. The second column provides the size of the cDNA insert contained in the corresponding cDNA clone.

Definitions

[030] The following definitions are provided to facilitate understanding of certain terms used throughout this specification.

[031] In the present invention, "isolated" refers to material removed from its original environment (e.g., the natural environment if it is naturally occurring), and thus is altered "by the hand of man" from its natural state. For example, an isolated polynucleotide could be part of a vector or a composition of matter, or could be contained within a cell, and still be "isolated" because that vector, composition of matter, or particular cell is not the original environment of the polynucleotide. The term "isolated" does not refer to genomic or cDNA libraries, whole cell total or mRNA preparations, genomic DNA preparations (including those separated by electrophoresis and transferred onto blots), sheared whole cell genomic DNA preparations or other compositions where the art demonstrates no distinguishing features of the polynucleotide sequences of the present invention.

[032] As used herein, a "polynucleotide" refers to a molecule having a nucleic acid sequence encoding SEQ ID NO:Y or a fragment or variant thereof, a nucleic acid sequence contained in SEQ ID NO:X (as described in column 3 of Table 1A) or the complement thereof, a cDNA sequence contained in Clone ID NO:Z (as described in column 1 of Table 1A and contained within a library deposited with the ATCC); a

nucleotide sequence encoding the polypeptide encoded by a nucleotide sequence in SEQ ID NO:B as defined in column 6 of Table 1B or a fragment or variant thereof; or a nucleotide coding sequence in SEQ ID NO:B as defined in column 6 of Table 1B or the complement thereof. For example, the polynucleotide can contain the nucleotide sequence of the full length cDNA sequence, including the 5' and 3' untranslated sequences, the coding region, as well as fragments, epitopes, domains, and variants of the nucleic acid sequence. Moreover, as used herein, a "polypeptide" refers to a molecule having an amino acid sequence encoded by a polynucleotide of the invention as broadly defined (obviously excluding poly-Phenylalanine or poly-Lysine peptide sequences which result from translation of a polyA tail of a sequence corresponding to a cDNA).

[033] As used herein, a "nervous system antigen" refers collectively to any polynucleotide disclosed herein (e.g., a nucleic acid sequence contained in SEQ ID NO:X or the complement thereof, or cDNA sequence contained in Clone ID NO:Z, or a nucleotide sequence encoding the polypeptide encoded by a nucleotide sequence in SEQ ID NO:B as defined in column 6 of Table 1B, or a nucleotide coding sequence in SEQ ID NO:B as defined in column 6 of Table 1B or the complement thereof and fragments or variants thereof as described herein) or any polypeptide disclosed herein (e.g., an amino acid sequence contained in SEQ ID NO:Y, an amino acid sequence encoded by SEQ ID NO:X, or the complement thereof, an amino acid sequence encoded by the cDNA sequence contained in Clone ID NO:Z, an amino acid sequence encoded by SEQ ID NO:B, or the complement thereof, and fragments or variants thereof as described herein). These nervous system antigens have been determined to be predominantly expressed in nervous system tissues, including normal or diseased tissues (as shown in Table 1A column 7 and Table 4).

[034] In the present invention, "SEQ ID NO:X" was often generated by overlapping sequences contained in multiple clones (contig analysis). A representative clone containing all or most of the sequence for SEQ ID NO:X is deposited at Human Genome Sciences, Inc. (HGS) in a catalogued and archived library. As shown, for example, in column 1 of Table 1A, each clone is identified by a cDNA Clone ID (identifier generally referred to herein as Clone ID NO:Z). Each Clone ID is unique to an individual clone and the Clone ID is all the information needed to retrieve a given

clone from the HGS library. Furthermore, certain clones disclosed in this application have been deposited with the ATCC on October 5, 2000, having the ATCC designation numbers PTA 2574 and PTA 2575; and on January 5, 2001, having the depositor reference numbers TS-1, TS-2, AC-1, and AC-2. In addition to the individual cDNA clone deposits, most of the cDNA libraries from which the clones were derived were deposited at the American Type Culture Collection (hereinafter "ATCC"). Table 7 provides a list of the deposited cDNA libraries. One can use the Clone ID NO:Z to determine the library source by reference to Tables 6 and 7. Table 7 lists the deposited cDNA libraries by name and links each library to an ATCC Deposit. Library names contain four characters, for example, "HTWE." The name of a cDNA clone (Clone ID NO:Z) isolated from that library begins with the same four characters, for example "HTWEP07". As mentioned below, Table 1A correlates the Clone ID NO:Z names with SEQ ID NO:X. Thus, starting with an SEQ ID NO:X, one can use Tables 1A, 6 and 7 to determine the corresponding Clone ID NO:Z, which library it came from and which ATCC deposit the library is contained in. Furthermore, it is possible to retrieve a given cDNA clone from the source library by techniques known in the art and described elsewhere herein. The ATCC is located at 10801 University Boulevard, Manassas, Virginia 20110-2209, USA. The ATCC deposits were made pursuant to the terms of the Budapest Treaty on the international recognition of the deposit of microorganisms for the purposes of patent procedure.

[035] In specific embodiments, the polynucleotides of the invention are at least 15, at least 30, at least 50, at least 100, at least 125, at least 500, or at least 1000 continuous nucleotides but are less than or equal to 300 kb, 200 kb, 100 kb, 50 kb, 15 kb, 10 kb, 7.5 kb, 5 kb, 2.5 kb, 2.0 kb, or 1 kb, in length. In a further embodiment, polynucleotides of the invention comprise a portion of the coding sequences, as disclosed herein, but do not comprise all or a portion of any intron. In another embodiment, the polynucleotides comprising coding sequences do not contain coding sequences of a genomic flanking gene (i.e., 5' or 3' to the gene of interest in the genome). In other embodiments, the polynucleotides of the invention do not contain the coding sequence of more than 1000, 500, 250, 100, 50, 25, 20, 15, 10, 5, 4, 3, 2, or 1 genomic flanking gene(s).

[036] A "polynucleotide" of the present invention also includes those polynucleotides capable of hybridizing, under stringent hybridization conditions, to sequences contained in SEQ ID NO:X, or the complement thereof (e.g., the complement of any one, two, three, four, or more of the polynucleotide fragments described herein), the polynucleotide sequence delineated in columns 8 and 9 of Table 2 or the complement thereof, and/or cDNA sequences contained in Clone ID NO:Z (e.g., the complement of any one, two, three, four, or more of the polynucleotide fragments, or the cDNA clone within the pool of cDNA clones deposited with the ATCC, described herein) and/or the polynucleotide sequence delineated in column 6 of Table 1B or the complement thereof. "Stringent hybridization conditions" refers to an overnight incubation at 42 degree C in a solution comprising 50% formamide, 5x SSC (750 mM NaCl, 75 mM trisodium citrate), 50 mM sodium phosphate (pH 7.6), 5x Denhardt's solution, 10% dextran sulfate, and 20 µg/ml denatured, sheared salmon sperm DNA, followed by washing the filters in 0.1x SSC at about 65 degree C.

[037] Also contemplated are nucleic acid molecules that hybridize to the polynucleotides of the present invention at lower stringency hybridization conditions. Changes in the stringency of hybridization and signal detection are primarily accomplished through the manipulation of formamide concentration (lower percentages of formamide result in lowered stringency), salt conditions, or temperature. For example, lower stringency conditions include an overnight incubation at 37 degree C in a solution comprising 6X SSPE (20X SSPE = 3M NaCl; 0.2M NaH₂PO₄; 0.02M EDTA, pH 7.4), 0.5% SDS, 30% formamide, 100 ug/ml salmon sperm blocking DNA; followed by washes at 50 degree C with 1XSSPE, 0.1% SDS. In addition, to achieve even lower stringency, washes performed following stringent hybridization can be done at higher salt concentrations (e.g. 5X SSC).

[038] Note that variations in the above conditions may be accomplished through the inclusion and/or substitution of alternate blocking reagents used to suppress background in hybridization experiments. Typical blocking reagents include Denhardt's reagent, BLOTTO, heparin, denatured salmon sperm DNA, and commercially available proprietary formulations. The inclusion of specific blocking reagents may require modification of the hybridization conditions described above, due to problems with compatibility.

[039] Of course, a polynucleotide which hybridizes only to polyA⁺ sequences (such as any 3' terminal polyA⁺ tract of a cDNA shown in the sequence listing), or to a complementary stretch of T (or U) residues, would not be included in the definition of "polynucleotide," since such a polynucleotide would hybridize to any nucleic acid molecule containing a poly (A) stretch or the complement thereof (e.g., practically any double-stranded cDNA clone generated using oligo dT as a primer).

[040] The polynucleotide of the present invention can be composed of any polyribonucleotide or polydeoxribonucleotide, which may be unmodified RNA or DNA or modified RNA or DNA. For example, polynucleotides can be composed of single- and double-stranded DNA, DNA that is a mixture of single- and double-stranded regions, single- and double-stranded RNA, and RNA that is mixture of single- and double-stranded regions, hybrid molecules comprising DNA and RNA that may be single-stranded or, more typically, double-stranded or a mixture of single- and double-stranded regions. In addition, the polynucleotide can be composed of triple-stranded regions comprising RNA or DNA or both RNA and DNA. A polynucleotide may also contain one or more modified bases or DNA or RNA backbones modified for stability or for other reasons. "Modified" bases include, for example, tritylated bases and unusual bases such as inosine. A variety of modifications can be made to DNA and RNA; thus, "polynucleotide" embraces chemically, enzymatically, or metabolically modified forms.

[041] The polypeptide of the present invention can be composed of amino acids joined to each other by peptide bonds or modified peptide bonds, i.e., peptide isosteres, and may contain amino acids other than the 20 gene-encoded amino acids. The polypeptides may be modified by either natural processes, such as posttranslational processing, or by chemical modification techniques which are well known in the art. Such modifications are well described in basic texts and in more detailed monographs, as well as in a voluminous research literature. Modifications can occur anywhere in a polypeptide, including the peptide backbone, the amino acid side-chains and the amino or carboxyl termini. It will be appreciated that the same type of modification may be present in the same or varying degrees at several sites in a given polypeptide. Also, a given polypeptide may contain many types of modifications. Polypeptides may be branched, for example, as a result of ubiquitination, and they may be cyclic, with or

without branching. Cyclic, branched, and branched cyclic polypeptides may result from posttranslation natural processes or may be made by synthetic methods. Modifications include acetylation, acylation, ADP-ribosylation, amidation, covalent attachment of flavin, covalent attachment of a heme moiety, covalent attachment of a nucleotide or nucleotide derivative, covalent attachment of a lipid or lipid derivative, covalent attachment of phosphatidylinositol, cross-linking, cyclization, disulfide bond formation, demethylation, formation of covalent cross-links, formation of cysteine, formation of pyroglutamate, formylation, gamma-carboxylation, glycosylation, GPI anchor formation, hydroxylation, iodination, methylation, myristoylation, oxidation, pegylation, proteolytic processing, phosphorylation, prenylation, racemization, selenoylation, sulfation, transfer-RNA mediated addition of amino acids to proteins such as arginylation, and ubiquitination. (See, for instance, PROTEINS - STRUCTURE AND MOLECULAR PROPERTIES, 2nd Ed., T. E. Creighton, W. H. Freeman and Company, New York (1993); POSTTRANSLATIONAL COVALENT MODIFICATION OF PROTEINS, B. C. Johnson, Ed., Academic Press, New York, pgs. 1-12 (1983); Seifter et al., Meth. Enzymol. 182:626-646 (1990); Rattan et al., Ann. N.Y. Acad. Sci. 663:48-62 (1992).)

[042] "SEQ ID NO:X" refers to a polynucleotide sequence described, for example, in Tables 1A or 2, while "SEQ ID NO:Y" refers to a polypeptide sequence described in column 5 of Table 1A. SEQ ID NO:X is identified by an integer specified in column 3 of Table 1A. The polypeptide sequence SEQ ID NO:Y is a translated open reading frame (ORF) encoded by polynucleotide SEQ ID NO:X. "Clone ID NO:Z" refers to a cDNA clone described in column 1 of Table 1A.

[043] "A polypeptide having biological activity" refers to a polypeptide exhibiting activity similar to, but not necessarily identical to, an activity of a polypeptide of the present invention, including mature forms, as measured in a particular biological assay, with or without dose dependency. In the case where dose dependency does exist, it need not be identical to that of the polypeptide, but rather substantially similar to the dose-dependence in a given activity as compared to the polypeptide of the present invention (i.e., the candidate polypeptide will exhibit greater activity or not more than about 25-fold less and, preferably, not more than about tenfold less activity,

and most preferably, not more than about three-fold less activity relative to the polypeptide of the present invention).

[044] Table 1A summarizes some of the polynucleotides encompassed by the invention (including contig sequences (SEQ ID NO:X) and clones (Clone ID NO:Z) and further summarizes certain characteristics of these polynucleotides and the polypeptides encoded thereby.

Polynucleotides and Polypeptides

TABLE 1A

Clone ID NO: Z	Contig ID:	SEQ ID NO: X	ORF (From-To)	AA SEQ ID NO: Y	Predicted Epitopes	Tissue Distribution Library code: count (see Table IV for Library Codes)	Cytologic Band	OMIM Disease Reference(s):
HADBF48	694915	11	59 - 247	3335		S0110: 2, L0438: 2, L0770: 1 and L0745: 1.		
HADBH59	531380	12	2 - 109	3336		S0110: 2	11	
HADMA09	848972	13	77 - 202	3337		H0390: 2		
HADMA74	585493	14	302 - 168	3338		L0754: 2, H0390: 1, T0010: 1 and L0731: 1.		
HAGAA66	522798	15	122 - 220	3339		S0010: 1, H0194: 1 and L0766: 1.		
HAGAH19	672049	16	191 - 316	3340		S0222: 1, S0010: 1, L0747: 1, L0756: 1 and S0260: 1.		
HAGAH48	578305	17	145 - 306	3341		S0010: 2		
HAGAH77	578301	18	178 - 438	3342		S0010: 2		
HAGAL80	848859	19	734 - 925	3343	Thr-16 to Arg-21.	L0438: 3, S0346: 2, H0009: 2, S6016: 1, S0222: 1, S0010: 1, H0052: 1, S0050: 1, S0388: 1, S0036: 1 and L0794: 1.		
HAGAN40	585410	20	28 - 303	3344	Arg-11 to Lys-24, Ser-48 to Glu-69.	S0010: 3		
HAGAN51	712782	21	295 - 447	3345		S0010: 2		
HAGAX70	715375	22	97 - 29	3346	Asp-4 to Asp-12.	S0010: 2		
HAGBK33	530431	23	5 - 142	3347	Glu-21 to Leu-35.	S0010: 2		

HAGBK78	760302	24	548 - 727	3348			L0439: 4, S0010: 2, H0051: 1 and H0100: 1.		
HAGBM60	735118	25	3 - 71	3349			S0010: 2		
HAGBQ28	507336	26	134 - 232	3350			S0010: 2		
HAGBV83	525851	27	3 - 227	3351			S0010: 2 and L0748: 1.		
HAGBX62	530278	28	3 - 146	3352			S0010: 2		
HAGCB09	578062	29	94 - 249	3353			S0010: 2		
HAGCB32	519573	30	142 - 303	3354			S0010: 3, L0803: 2 and L0809: 1.		
HAGCC42	935310	31	2 - 136	3355			S0010: 1 and S0260: 1.		
HAGCE06	960592	32	1 - 216	3356	Pro-24 to Val-29, Asp-37 to His-43, Lys-58 to Asn-66.		S0010: 2		
HAGCE07	954244	33	117 - 350	3357	Ser-1 to Gly-7.		S026: 1, S0010: 1 and S0346: 1.		
HAGCF46	530276	34	59 - 271	3358	Glu-1 to Lys-8, Asp-19 to Pro-30, Ile-33 to Cys-40.		S0010: 2 and L0766: 2.		
HAGCM32	850473	35	232 - 402	3359	Pro-38 to Arg-50.		H0052: 3, S6024: 1, H0261: 1 and S0010: 1.		
HAGCM64	671389	36	96 - 389	3360	Trp-1 to Trp-11, Asp-17 to Cys-24.		H0051: 3, S0036: 2, S0035: 1, S0010: 1 and S0260: 1.		
HAGCS70	530265	37	54 - 245	3361			S0010: 2		
HAGCV72	661535	38	20 - 133	3362	Gln-6 to Trp-13.		S0010: 1, S0346: 1, L0770: 1 and L0790: 1.		
HAGCX13	966686	39	22 - 372	3363			L0742: 3, L0769: 2, S6024: 1, S0222: 1,		

HAGCY44	716716	40	3 - 95	3364			S0010: 1, S0038: 1, L0768: 1, L0794: 1 and L0790: 1.		
HAGCZ78	772822	41	676 - 927	3365	Ser-8 to Tyr-13, Pro-29 to Ser-36.		S0010: 1 and S0346: 1. L0439: 2, L0759: 2, S0010: 1 and H0052: 1.		
HAGDB58	681932	42	98 - 244	3366	Ser-1 to Tyr-6, Pro-24 to Asn-31.		S0010: 3, S0007: 1 and S0346: 1.		
HAGDD86	916768	43	1 - 345	3367	Trp-35 to Thr-41.		S0010: 3		
HAGDE71	760459	44	15 - 188	3368			S0010: 2		
HAGDH10	964832	45	2 - 262	3369	Leu-33 to Cys-40.		S0010: 2 and L0770: 2.		
HAGDN43	576355	46	85 - 237	3370	Gly-1 to Ala-13, Ser-21 to Trp-26.		S0010: 2		
HAGDO14	526655	47	16 - 417	3371	Pro-17 to Arg-25.		H0009: 3 and S0010: 1.		
HAGDO19	909995	48	2 - 514	3372	Arg-1 to Ser-9, Pro-16 to Cys-21, Ala-26 to Asp-40, Pro-83 to Gln-89.		AR061: 0, AR089: 0 2 L0794: 7, S0010: 3, H0052: 2, S0222: 1, H0438: 1, S0665: 1, S0036: 1, S0038: 1, L0594: 1 and L0096: 1.		
HAGDT85	578128	49	3 - 200	3373	Thr-6 to Cys-13, His-16 to Gly-21, Ser-32 to Arg-39, Glu-54 to Ser-66.		T0082: 1 and S0010: 1.		
HAGDU23	960248	50	3 - 365	3374	Gly-16 to Ser-22, Pro-33 to Asn-39, Leu-75 to Asn-80.		L0742: 13, L0439: 6, L0438: 3, S0010: 2, S6028: 2, L0756: 2, S0346: 1, S0051: 1,		

HAGDV46	576334	51	35 - 325	3375	Thr-12 to Arg-21.	T0010: 1 and L0789: 1.	
HAGDX45	578644	52	2 - 133	3376	Asn-14 to Asn-21, Phe-26 to Ser-40.	S0010: 2	
HAGDY53	878471	53	51 - 668	3377	Pro-17 to His-22, Pro-27 to Gly-32, Glu-62 to Arg-72.	S0010: 1 and T0010: 1.	
HAGDZ16	662063	54	1 - 189	3378		S0222: 1, T0082: 1, S0010: 1 and S6028: 1.	
HAGEA58	835626	55	3 - 374	3379	Thr-22 to Tyr-31.	S0010: 1 and S0346: 1.	20q12-q13
HAGEC14	658552	56	2 - 202	3380		S0010: 1 and S0346: 1, L0803: 2, L0521: 1 and L0792: 1.	600281, 600281
HAGED01	913677	57	86 - 379	3381		L0747: 2, S6024: 1, S0010: 1, L0646: 1, L0766: 1 and L0665: 1.	
HAGED70	576337	58	118 - 201	3382		S0007: 1 and S0010: 1.	
HAGEF07	953547	59	113 - 328	3383		S0010: 2	
HAGHH51	954889	60	148 - 414	3384		S0010: 1 and S0346: 1.	
HAGEK04	694464	61	2 - 235	3385		S0010: 2, L0753: 1 and L0592: 1.	
HAGEL88	661398	62	580 - 837	3386		S0010: 2	
HAGEN17	576665	63	173 - 274	3387		L0756: 2, S0010: 1, S0388: 1, S0036: 1, L0638: 1, L0438: 1, L0355: 1, L0439: 1 and L0740: 1.	
HAGEP22	576303	64	3 - 212	3388	His-1 to Ser-6,	S0001: 1 and S0010: 1.	
						S0010: 2	

							Asn-19 to Ser-25, Gly-50 to Cys-57, Tyr-64 to Ser-70.				
HAGEP85	883841	65	3 - 356	3389			Ser-2 to Gly-8.		S0010: 2		
HAGER03	924599	66	28 - 306	3390					S0010: 2		
HAGER07	953546	67	3 - 236	3391			Ser-10 to Ser-28.		S0010: 2		
HAGER65	576805	68	252 - 455	3392			Val-25 to Trp-32.		S0010: 1 and S0050: 1.		
HAGEV41	694705	69	1 - 279	3393					S0010: 2		
HAGEY22	826123	70	110 - 343	3394			Ile-7 to Asn-19.		S0010: 2		
HAGEZ39	578306	71	180 - 305	3395			Trp-19 to Lys-33.		S0010: 2		
HAGEZ72	578053	72	50 - 172	3396			Leu-12 to Arg-17, Gly-24 to Arg-41.		S0010: 2		
HAGFB66	791951	73	71 - 301	3397			Glu-7 to Gln-16, Arg-24 to Arg-31, Gly-52 to Gly-58.		S0010: 2		
HAGFE37	705797	74	347 - 162	3398			Val-17 to Lys-22, Glu-40 to Pro-52.		S6024: 1, S0010: 1, L0744: 1 and L0439: 1.		
HAGFJ61	578296	75	138 - 299	3399			Glu-6 to Val-12, Thr-14 to Val-22, Ala-31 to Pro-49.		S0010: 2		
HAGFM28	705808	76	304 - 471	3400					S0222: 2, S0010: 1, S0346: 1, L0438: 1 and L0439: 1.		
HAGFO78	950715	77	1 - 951	3401			Leu-1 to His-8.		S0010: 2, L0438: 2, L0439: 2 and H0566: 1.		
HAGFO86	935711	78	2 - 268	3402			Arg-13 to Phe-22, Asn-24 to Ala-31, Glu-48 to Tyr-60.		S0010: 2		

HAGFS07	835924	79	443 - 682	3403	Pro-20 to Asn-26.	H0442: 1 and S0010: 1.	
HAGFT60	578082	80	177 - 332	3404	Pro-10 to Ser-15.	S0010: 2	
HAGFV82	522990	81	591 - 848	3405		S0010: 2 and H0051: 1.	
HAGFW44	715865	82	31 - 243	3406	His-38 to Ser-52.	S0010: 3, L0770: 3, L0439: 3, L0438: 2, L0777: 2, L0630: 1, L0764: 1, L0794: 1, L0352: 1 and L0743: 1.	
HAGGB28	686101	83	47 - 220	3407		S0346: 2	
HAGGC20	913640	84	304 - 480	3408	Phe-15 to Ser-24.	L0439: 3, L0438: 2, H0229: 1, S0665: 1, S0346: 1, S0049: 1 and L0366: 1.	
HAGGU27	682713	85	184 - 315	3409		S0346: 2	
HAGGU63	744725	86	3 - 155	3410	Ala-5 to Leu-11.	S0346: 2	
HAGHB19	668285	87	1 - 177	3411	Gln-25 to Phe-32.	S0010: 1 and S0346: 1.	
HAGHC02	919181	88	107 - 259	3412		S0346: 1 and H0009: 1.	
HAGHE63	744722	89	5 - 307	3413	Pro-22 to Gly-28, Gly-37 to Gln-42, Asn-71 to Tyr-82.	S0346: 2	
HAGHR11	848869	90	34 - 369	3414		L0005: 1, S0010: 1 and S0346: 1.	
HAGHR85	764560	91	242 - 373	3415	Asn-38 to Asp-44.	L0439: 4, S0400: 1, S0346: 1, H0374: 1 and S0260: 1.	
HAGHZ04	927382	92	3 - 254	3416		S0346: 2	
HAGID05	930784	93	326 - 496	3417	Pro-4 to Lys-29.	S0346: 2	
HAGII06	933845	94	1 - 537	3418	Ser-12 to Gly-18,	L0439: 2, S0665: 1,	

							Thr-31 to Gly-39, His-46 to Arg-51, Ser-58 to Asp-85.	S0346: 1, L0352: 1 and L0366: 1.		
HARAB47	720654	95	18 - 179	3419				T0082: 1, H0009: 1, L0521: 1 and L0361: 1.		
HARAB58	735212	96	168 - 362	3420			Lys-52 to Ser-57.	S5026: 1 and T0082: 1.		
HARAB68	713402	97	1 - 279	3421				S0222: 1, T0082: 1 and H0009: 1.		
HARAD15	507364	98	54 - 269	3422			Leu-19 to Gly-29, Val-32 to Ser-39.	T0082: 2		
HARAK82	530541	99	2 - 133	3423			Ala-1 to Ala-12, Arg-16 to Thr-23, Arg-36 to Ser-44.	T0082: 2		
HARAR61	578124	100	61 - 276	3424			Lys-11 to Met-16, His-28 to Arg-33, Ala-65 to Asn-72.	T0082: 1 and S0010: 1.		
HARAZ05	564000	101	3 - 305	3425			Phe-8 to Phe-15.	AR061: 5, AR089: 3 H0438: 1 and T0082: 1.	11q13	102200, 106100, 131100, 131100, 131100, 131100, 133780, 147050, 153700, 161015, 164009, 168461, 168461, 168461.

HAVMB02	918947	102	13 - 243	3426	Arg-1 to Ala-11, Ala-19 to Asp-29, Gly-67 to Gly-73.	L0439: 2, S0412: 2 and L0438: 1.	180721, 180840, 191181, 193235, 209901, 232600, 259700, 259770, 600045, 600319, 600528, 601884
HAVMC28	685882	103	323 - 487	3427	Ser-4 to Leu-12, Met-14 to Ser-23.	S0412: 2 and L0684: 1.	
HAVMC39	721191	104	83 - 271	3428	Ile-16 to Lys-23.	S0412: 3	
HAVMD02	967936	105	1 - 51	3429		S0412: 4	
HAVMD50	723893	106	67 - 291	3430		S0412: 2	
HAVMF87	731275	107	248 - 448	3431	Pro-8 to Arg-18.	S0007: 3, L0766: 3, S0388: 1, L0794: 1, L0803: 1, L0809: 1 and S0412: 1.	
HAVMM56	974009	108	311 - 535	3432	Pro-9 to Arg-19, His-29 to Asn-44.	S0412: 3	
HAVMM66	922771	109	89 - 265	3433	Arg-1 to Thr-6, Asn-19 to Thr-25.	S0412: 2	
HAVMN25	914798	110	1124 - 801	3434		S0412: 3, L0803: 2,	

HAVMN29	975160	111	379 - 555	3435	Ser-48 to Ile-57.	L0005: 1, S0049: 1, L0659: 1, L0777: 1 and L0731: 1.		
HAVMN51	850763	112	74 - 232	3436	Asp-2 to Gly-8, Gly-14 to Ser-19, Arg-47 to Asn-53.	S0412: 20 and S0378: 1. S0412: 3 and L0740: 1.		
HAVMN76	963088	113	3 - 398	3437	Asp-36 to Glu-42, Ser-44 to Val-53, Glu-65 to Ser-77, Asp-106 to Val-118.	L0439: 3, S0412: 3, L0770: 1, L0768: 1, L0794: 1 and L0779: 1.		
HAVMR55	964692	114	344 - 523	3438		S0412: 17		
HAVMR67	880563	115	102 - 296	3439	Val-45 to Lys-51.	S0412: 11		
HAVMR81	848517	116	58 - 240	3440	Glu-19 to Thr-30.	S0412: 2		
HAVMV03	958075	117	205 - 426	3441	Gln-30 to Arg-38, Leu-56 to Lys-67.	S0412: 5		
HAVMW03	922717	118	283 - 465	3442	Ala-1 to Trp-6.	S0412: 2 and L0599: 1. 17		
HAVMZ79	926449	119	3 - 209	3443	Arg-22 to Phe-31, Arg-45 to Asn-50, Leu-58 to Ile-64.	L0439: 6, S0412: 6, S0624: 1, S0222: 1 and L0665: 1.		
HAVNB60	878508	120	13 - 219	3444	Arg-1 to Gly-6.	S0412: 6		
HAVNB72	914645	121	13 - 315	3445	Arg-1 to Pro-13, Lys-23 to Glu-28, His-52 to Ser-57, Val-64 to Ser-73.	S0412: 3	3p21.1	150250, 164500, 168468, 182280, 238310, 600163,

									601226, 601916
HAVNG11	914764	122	90 - 236	3446				S0412: 2	
HAVNG45	926389	123	197 - 355	3447	Asp-44 to Arg-50.			L0740: 3, L0439: 2, S0412: 2, L0600: 2, L0109: 1, L0065: 1, L0774: 1, L0776: 1, L0659: 1, L0664: 1, L0438: 1, L0779: 1 and L0777: 1.	
HAVNL28	851496	124	111 - 269	3448				S0412: 2	
HAVNO67	957877	125	332 - 505	3449				S0412: 4	
HAVNQ05	930829	126	378 - 641	3450	Glu-41 to Thr-46.			S0412: 5	
HAVNQ24	967940	127	225 - 338	3451				S0412: 2 and H0052: 1.	
HAVNT19	926452	128	3 - 188	3452				S0412: 2	
HAVNX80	927238	129	1265 - 1011	3453	Leu-25 to Asn-33, Glu-56 to Glu-63, Leu-72 to Glu-78.			S0412: 43, L0439: 4, S0414: 2, L0438: 2, S0378: 2, H0406: 1, S0222: 1, H0575: 1, S0051: 1, L0744: 1, L0747: 1, L0777: 1 and S0456: 1.	
HAVNY23	918172	130	447 - 611	3454	Phe-13 to Asp-20, Arg-25 to Met-32.			S0412: 8, L0438: 1 and L0439: 1.	
HAVNZ12	969505	131	13 - 114	3455	Arg-1 to Gly-6.			S0412: 5	
HAVOA03	917911	132	184 - 2	3456				S0412: 4	
HAVOA06	933968	133	410 - 736	3457				S0412: 6, S0414: 4, L0439: 2, S0300: 1,	

HAVOA07	952086	134	3 - 134	3458	Glu-10 to Arg-15, Leu-22 to Arg-27.	S0010: 1, H0051: 1, L0769: 1, L0666: 1 and L0756: 1.		
HAVOA91	957845	135	3 - 224	3459		S0412: 5		
HAVOD03	952052	136	47 - 199	3460		S0412: 2		
HAVOG89	924004	137	2 - 226	3461	Ser-10 to His-21.	S0412: 13		
HAVOK56	902305	138	1 - 189	3462	Leu-28 to Gly-40.	S0412: 2		
HAVOK66	914881	139	34 - 333	3463		S0412: 2		
HAVOL37	848471	140	124 - 342	3464		S0412: 2, S0414: 1 and L0748: 1.		
HAVOS38	922682	141	166 - 399	3465	Pro-26 to Arg-34, His-44 to Ser-54.	S0412: 3, L0743: 1 and L0744: 1.		
HAVOS85	926415	142	3 - 182	3466	Asn-1 to Gly-7.	S0412: 2		
HAVOT53	919368	143	97 - 219	3467	His-6 to Phe-17.	L0745: 2, L0448: 1, S6026: 1, L0756: 1 and S0412: 1.		
HAVOU04	926412	144	1 - 171	3468	Pro-1 to Gln-9, Ser-16 to Arg-22.	S0412: 11, H0351: 1 and H0009: 1.		
HAVOU34	848463	145	39 - 233	3469	His-1 to Thr-6.	S0412: 2		
HAVOW80	965124	146	344 - 505	3470	Arg-32 to Thr-43, Arg-48 to Arg-54.	S0412: 10		
HAVOX65	975320	147	398 - 601	3471	Thr-12 to Lys-18, Arg-52 to Ser-59.	S0412: 27		
HAVPB31	958136	148	149 - 298	3472		S0412: 2		
HAVPB55	893691	149	364 - 513	3473	Pro-26 to Lys-34.	S0412: 2 and L0742: 1.		
HAVTA22	746092	150	2 - 109	3474	Gln-11 to Thr-19.	S0414: 3		

HAVTA48	726079	151	13 - 150	3475	Arg-1 to Gly-6, Lys-29 to Ser-35.	S0414: 3		
HAVTC92	726165	152	399 - 533	3476		S0414: 7		
HAVTD81	966142	153	272 - 424	3477		S0414: 3		
HAVTE18	918221	154	62 - 235	3478		S0414: 6, L0439: 2, L0438: 1 and S0412: 1.		
HAVTE73	914403	155	357 - 485	3479	Thr-5 to Val-11.	S0414: 7		
HAVTF02	918901	156	629 - 805	3480		S0414: 19, L0638: 2, L0776: 2, L0625: 1, L0659: 1 and L0756: 1.		
HAVTF22	965784	157	192 - 1	3481	Arg-1 to Gly-8, Ile-22 to Lys-28, Leu-53 to Phe-63.	S0414: 2 and L0746: 1.		
HAVTG14	878591	158	146 - 316	3482		S0414: 2		
HAVTH93	965771	159	1 - 108	3483		S0414: 2		
HAVTI80	924083	160	3 - 221	3484		S0414: 10		
HAVTN04	926890	161	3 - 164	3485		S0414: 2		
HAVTN45	946507	162	154 - 381	3486	Arg-9 to Gln-19, Arg-30 to Phe-35, Pro-53 to Ser-68.	S0414: 9		
HAVTN64	958917	163	218 - 394	3487	Leu-36 to Asn-48.	S0414: 3	1p35	118210, 120550, 120570, 120575, 121800, 130500, 133200, 138140,

										138971, 171760, 171760, 172411, 185470, 230350, 255800, 602771
HAVTR02	918210	164	408 - 572	3488		Pro-20 to Glu-27.	S0414: 5			
HAVTR34	965633	165	104 - 250	3489		Gly-12 to Lys-23, Glu-34 to Leu-43.	S0414: 2	10		
HAVTS55	931215	166	2 - 265	3490		Ala-3 to Gly-9, Glu-32 to Ile-40, Thr-77 to Gln-82.	S0414: 4			
HAVTT04	926481	167	341 - 622	3491		Ser-28 to His-35, Arg-73 to Trp-79.	S0414: 56			
HAVTU03	936299	168	1 - 216	3492			S0414: 4			
HAVUD11	965758	169	56 - 256	3493			S0414: 4			
HAVUI28	930884	170	603 - 463	3494			S0414: 11 and S0114: 1.			
HAVUK83	965769	171	182 - 460	3495		Ser-43 to Tyr-48, Thr-73 to Asp-79.	S0414: 4 and L0592: 1.			
HAVUL27	848447	172	209 - 436	3496		Gln-3 to Thr-9, Ser-22 to Thr-32, Thr-39 to Met-47, Pro-49 to Trp-54, Arg-56 to Lys-69.	S0414: 3			
HAVUQ20	966077	173	2 - 184	3497			S0414: 9			

HAVUQ71	966824	174	3 - 149	3498	Ala-13 to Ser-21, Phe-44 to Leu-49.	S0414: 7		
HAVUR03	922684	175	373 - 543	3499		S0414: 6		
HAVUR44	935998	176	396 - 121	3500	Asn-11 to Asn-19, Tyr-27 to Ser-33, Lys-56 to Asn-68.	S0414: 2, L0021: 1, H0052: 1 and L0745: 1.		
HAVUR50	928287	177	42 - 383	3501	Tyr-35 to Gly-43, Ser-89 to Leu-98.	S0414: 3		
HAVUT92	922455	178	495 - 373	3502		S0414: 6		
HAVUV10	940091	179	154 - 381	3503	Arg-9 to Gln-19, Arg-30 to Phe-35, Pro-53 to Ser-68.	S0414: 6		
HAVUX44	918137	180	228 - 422	3504		S0414: 3		
HAVVA69	975161	181	589 - 825	3505	Asn-26 to Asn-31.	S0414: 25, L0756: 2, S0222: 1, L0796: 1 and S0412: 1.		
HAVVB22	847291	182	398 - 601	3506	Lys-4 to Lys-22.	S0414: 2		
HAVVF59	864419	183	62 - 295	3507	Thr-1 to Asn-11.	S0414: 6		
HAVVH11	960201	184	3 - 206	3508		S0414: 20		
HAVVH15	919569	185	2 - 187	3509	Ser-9 to Arg-14, Ala-32 to Pro-39, Ser-56 to Glu-62.	S0414: 3		
HAVVH65	852908	186	350 - 484	3510	Phe-1 to Thr-6.	S0414: 3		
HAVVO77	952748	187	165 - 341	3511	Arg-1 to Met-11, Ser-31 to Trp-39, Lys-46 to Pro-59.	S0414: 13	11ql2-ql3	102200, 106100, 131100, 131100, 131100,

									133780, 147050, 153700, 161015, 164009, 168461, 168461, 168461, 180721, 180840, 191181, 193235, 209901, 232600, 259700, 259770, 600045, 600319, 600528, 601884
HAVVQ38	864421	188	283 - 423	3512		S0414: 10	4q13-q21		103600, 103600, 103600, 104150, 104150, 104500, 125490, 147790, 170650,

												173910, 252500, 252500
HAVVR10	963072	189	1 - 126	3513		Ser-7 to Tyr-14, Pro-19 to Gly-24.			S0414: 2			
HAVVS63	957771	190	75 - 341	3514		Arg-25 to Thr-33, Thr-60 to Arg-89.			S0414: 34			
HAVVU45	973499	191	91 - 201	3515		Gly-20 to Gly-29.			S0414: 4			
HAVVV49	930875	192	1050 - 1235	3516		Met-5 to Gln-10, Thr-45 to Leu-62.			S0414: 12			
HAVVY03	963065	193	622 - 380	3517		Gln-21 to Cys-26, Ser-70 to Trp-75.			S0414: 4			
HAVVY15	975308	194	255 - 434	3518		Thr-12 to Ser-19.			S0414: 5			
HAVVZ93	948617	195	3 - 143	3519					S0414: 3			
HAXHB11	524232	196	221 - 3	3520					T0126: 2			
HBBBD96	717856	197	1 - 102	3521		Pro-14 to Gln-19.			H0374: 1 and H0052: 1.			
HBBF45	753160	198	2 - 175	3522					H0374: 2			
HBBMA89	787032	199	5 - 241	3523		Lys-1 to Thr-13.			S0282: 1 and H0389: 1.			
HBHAB88	529943	200	1 - 117	3524					S0029: 2			
HBHAC17	665023	201	117 - 479	3525		Asn-27 to Phe-39.			S0029: 2, S0282: 1 and S0260: 1.			
HBHAD67	530087	202	124 - 264	3526		Leu-12 to Ser-21, Cys-29 to Thr-36.			S0029: 2			
HBHAD71	530088	203	208 - 300	3527					S0029: 2			
HBHAE14	973759	204	269 - 436	3528		Asp-1 to Gly-6, Val-31 to Glu-40.			S0029: 3			
HBHAE65	530085	205	47 - 190	3529		Gln-1 to Tyr-13.			S0029: 2			

HBHAF50	530028	206	10 - 159	3530			S0029: 2		
HBHAG21	530082	207	62 - 163	3531	Arg-1 to Ser-7.		L0805: 3, S0029: 2, L0764: 1 and L0766: 1.		
HBHAG56	733709	208	43 - 198	3532	Cys-22 to Asp-34.		S0029: 2		
HBIAE07	954121	209	3 - 371	3533	Arg-10 to Ser-15.		S0049: 1, H0052: 1, L0742: 1 and L0731: 1.		
HBIAE50	572444	210	1 - 168	3534	Pro-8 to Thr-16, His-19 to Ser-27.		S0049: 2		
HBIAE83	529103	211	70 - 180	3535	Glu-10 to Gly-17.		S0049: 2, L0747: 1 and L0599: 1.		
HBIAF60	529098	212	1 - 213	3536	Arg-7 to Glu-17.		S0049: 2		
HBIAH61	742110	213	156 - 326	3537	Gly-30 to Phe-39, Gln-47 to Arg-56.		S6026: 1, S0049: 1 and L0756: 1.		
HBIAI29	529154	214	3 - 188	3538			S0049: 2		
HBIAI40	525881	215	25 - 156	3539			S0010: 1 and S0049: 1.		
HBIAJ39	575306	216	3 - 131	3540	Arg-11 to Ile-17, Thr-31 to Arg-36.		T0010: 4, L0415: 2, S0049: 2, L0351: 2, L0805: 2, S6026: 1, H0618: 1, S0010: 1 and H0052: 1.		
HBIK17	848067	217	228 - 365	3541	Cys-1 to His-8.		S0049: 2		
HBIK19	572416	218	2 - 202	3542	Pro-58 to Lys-63.		S0049: 2 and L0803: 1.		
HBIK70	848061	219	42 - 230	3543	Gly-16 to Tyr-23.		S0049: 2		
HBIAN10	968383	220	57 - 281	3544			S0049: 2		
HBIAN45	967677	221	3 - 77	3545	His-1 to Phe-13, Gly-19 to Lys-25.		S0049: 2		
HBIAO95	530309	222	66 - 245	3546	Gly-12 to Gly-17.		S0001: 1, S0049: 1 and L0439: 1.		

HBIAV51	429335	223	225 - 28	3547			H0438: 1 and S0049: 1.		
HBIAZ52	853026	224	1 - 186	3548			S0049: 1 and H0052: 1.		
HBIBD67	698874	225	167 - 376	3549		Gly-46 to Ala-52.	L0794: 4, S0300: 1, S0222: 1, S0049: 1 and L0438: 1.		
HBIBE32	668820	226	2 - 166	3550			S0049: 2		
HBIBK27	528057	227	3 - 206	3551		Ser-6 to Gly-12.	S0038: 2 and S0049: 1.		
HBIBS89	960979	228	1 - 291	3552		Arg-2 to Gln-10, Thr-26 to Arg-39.	L0439: 6, L0438: 4, H0052: 2, H0009: 2, S0007: 1, S0222: 1, H0438: 1, S0049: 1, H0051: 1 and L0742: 1.		
HBIBT57	854572	229	190 - 633	3553		Pro-10 to Pro-15, Trp-58 to Gln-75, Arg-105 to His-111.	H0052: 6, S0049: 2, H0123: 1, S0051: 1, L0769: 1, L0776: 1 and L0439: 1.		
HBIBV08	848037	230	136 - 384	3554		Thr-8 to Ile-19, Pro-59 to Glu-67, Pro-78 to Gly-83.	S0049: 2		
HBICA34	848038	231	57 - 245	3555			S0049: 1 and S0031: 1.		
HBICH13	916943	232	1 - 219	3556			S0049: 2		
HBICH16	848028	233	1 - 318	3557		Gly-1 to Ser-6, Thr-44 to Arg-50, Phe-74 to Glu-82.	S0049: 2		
HBICH18	935833	234	3 - 137	3558		His-1 to Glu-13.	S0049: 2		
HBICH28	711319	235	130 - 351	3559			S0049: 2		
HBICB31	573872	236	200 - 430	3560			H0052: 2 and S0049: 1.		
HBICP57	810464	237	1 - 228	3561		Lys-1 to Gly-6.	AR089: 7, AR061: 7	22q	

									S0049: 1, H0052: 1, L0146: 1 and T0010: 1.		
HBICT25	771414	238	3 - 155	3562					S0007: 4, S0049: 1 and H0052: 1.		
HBICW21	669794	239	60 - 218	3563					S0049: 2		
HBIFA49	578755	240	3 - 134	3564					H0434: 2		
HBIFC58	578759	241	53 - 154	3565					H0434: 2		
HBLAA35	723547	242	55 - 288	3566					H0006: 2		
HBOAA12	857619	243	66 - 383	3567					H0310: 1 and S0388: 1.		
HBOAA46	657370	244	164 - 364	3568					H0310: 1, S0051: 1, L0657: 1 and L0587: 1.		
HBOAB26	666961	245	65 - 235	3569					H0310: 1, H0052: 1, L0438: 1 and L0439: 1.		
HBOAD27	506408	246	1 - 168	3570					L0157: 5, L0805: 2, L0756: 2, L0753: 2, S0412: 2, S0010: 1, H0310: 1, L0779: 1 and L0759: 1.		
HBQAA11	839996	247	364 - 504	3571					H0229: 2		
HBQAA43	522629	248	33 - 263	3572					H0229: 2		
HBQAB59	504319	249	414 - 244	3573					L0439: 5, H0229: 1 and T0010: 1.		
HBQAC59	739625	250	198 - 332	3574					H0229: 2		
HBQAE38	525827	251	201 - 1	3575					L0439: 3 and H0229: 2.		

HBQAE94	847712	252	17 - 154	3576	Ser-57 to Ile-67.			
HBWAG01	921776	253	2 - 82	3577	Lys-5 to Glu-14.		H0229: 2	
HBWAG76	767711	254	462 - 40	3578			S0021: 2	
	769922	3236	3 - 200	6560			AR089: 5, AR061: 2 S0001: 1 and S0021: 1.	
HBWAI30	523314	255	160 - 249	3579			S0021: 2	
HBWAK22	719911	256	3 - 209	3580	Asp-7 to Arg-13.		S0386: 1 and S0021: 1.	
HBWBB27	682565	257	3 - 191	3581	Gly-1 to Pro-9, Ala-19 to Met-26, Ser-54 to Ser-60.		H0052: 1 and S0386: 1.	
HBWBD18	665283	258	3 - 251	3582	Pro-7 to Ser-12, Lys-27 to Lys-37, Ser-46 to Leu-51.		S0386: 2	
HBWBD84	662269	259	101 - 274	3583			S0386: 2	
HBWBE94	773285	260	180 - 323	3584	Gly-27 to Glu-34.		S0386: 2	
HBWBF56	733029	261	160 - 264	3585			S0386: 2	
HBWBF61	741341	262	1 - 213	3586	Cys-57 to Lys-65.		S0386: 2	
HBWBG07	952471	263	3 - 284	3587			S0386: 2	
HBWBG20	669205	264	110 - 307	3588			S0386: 2	
HBWBG32	698710	265	135 - 467	3589	Ile-57 to Lys-65.		S0386: 2	
HBWBH63	956217	266	208 - 537	3590			S0222: 1, S0386: 1 and L0776: 1.	
HBWBI83	673938	267	229 - 405	3591			S0386: 2	
HBWBI90	863620	268	212 - 391	3592	Thr-30 to Trp-35, Gly-49 to Gly-55.		S0386: 2	
HBWBJ85	765191	269	239 - 388	3593			S0386: 2	
HBWBK16	661400	270	293 - 451	3594			S0386: 2	

HBWBK17	828053	271	3 - 290	3595	Pro-28 to Pro-43, Thr-48 to Arg-53.	S0386: 2	
HBWBK22	673941	272	171 - 398	3596	Gln-14 to Asp-19.	S0386: 2	
HBWBK24	676765	273	493 - 218	3597		S0386: 2	
HBWBK28	685985	274	40 - 180	3598		S0386: 2	
HBWBK37	706077	275	174 - 308	3599		S0386: 2	
HBWBK38	706092	276	154 - 336	3600	Leu-5 to Gln-19.	S0386: 2	
HBWBK46	718697	277	73 - 240	3601	His-22 to Arg-28.	S0386: 3	
HBWBK48	721282	278	82 - 195	3602		S0386: 2	
HBWBK49	722348	279	3 - 167	3603	Lys-6 to Arg-16, Ser-46 to Arg-55.	S0386: 2	
HBWBK51	670192	280	236 - 403	3604		S0386: 2	
HBWBK53	863584	281	1 - 195	3605		S0386: 2	
HBWBK54	729178	282	115 - 291	3606	Lys-7 to Arg-22.	S0386: 2	
HBWBK61	741312	283	103 - 261	3607		S0386: 2	
HBWBK63	744643	284	162 - 332	3608		S0386: 2	
HBWBK67	751263	285	3 - 134	3609		S0386: 2	
HBWBK68	752702	286	55 - 204	3610		S0386: 2	
HBWBK69	754731	287	215 - 352	3611		S0386: 2	
HBWBK71	760031	288	81 - 260	3612	Gly-46 to Trp-51.	S0386: 2	
HBWBK72	863625	289	301 - 525	3613		S0386: 2, H0052: 1 and L0758: 1.	
HBWBK74	765192	290	1 - 225	3614	Ser-41 to Trp-48.	S0386: 2	
HBWBK76	767759	291	70 - 210	3615	Ser-35 to Asn-40.	S0386: 2	
HBWBK79	774615	292	79 - 204	3616	Asp-37 to Ser-42.	S0386: 2	
HBWBK82	779503	293	1 - 135	3617	Gln-16 to Thr-29.	S0386: 2	
HBWBK85	784063	294	230 - 373	3618		S0386: 2	
HBWBK90	788608	295	62 - 286	3619	Arg-16 to Trp-22,	S0386: 2	

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[Continued on next page]

(54) Title: NUCLEIC ACIDS, PROTEINS, AND ANTIBODIES

(57) Abstract: The present invention relates to novel nervous system related polynucleotides and the polypeptides encoded by these polynucleotides herein collectively known as "nervous system antigens", and the use of such nervous system antigens for detecting disorders of the nervous system, particularly the presence of cancers of the nervous system and nervous system cancer metastases. More specifically, isolated nervous system associated nucleic acid molecules are provided encoding novel nervous system associated polypeptides. Novel nervous system polypeptides and antibodies that bind to these polypeptides are provided. Also provided are vectors, host cells, and recombinant and synthetic methods for producing human nervous system associated polynucleotides and/or polypeptides. The invention further relates to diagnostic and therapeutic methods useful for diagnosing, treating, preventing and/or prognosing disorders related to the nervous system, including cancers of the nervous system, and therapeutic methods for treating such disorders. The invention further relates to screening methods for identifying agonists and antagonists of polynucleotides and polypeptides of the invention. The present invention further relates to methods and/or compositions for inhibiting the production and function of the polypeptides of the present invention.

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Nucleic Acids, Proteins, and Antibodies

[001] This application refers to a "Sequence Listing" that is provided only on electronic media in computer readable form pursuant to Administrative Instructions Section 801(a)(i). The Sequence Listing forms a part of this description pursuant to Rule 5.2 and Administrative Instructions Sections 801 to 806, and is hereby incorporated in its entirety.

[002] The Sequence Listing is provided as an electronic file (PC010PCT_seqList.txt, 23,109,132 bytes in size, created on January 12, 2001) on four identical compact discs (CD-R), labeled "COPY 1," "COPY 2," "COPY 3," and "CRF." The Sequence Listing complies with Annex C of the Administrative Instructions, and may be viewed, for example, on an IBM-PC machine running the MS-Windows operating system by using the V viewer software, version 2000 (see World Wide Web URL: <http://www.fileviewer.com>).

Field of the Invention

[003] The present invention relates to novel nervous system related polynucleotides, the polypeptides encoded by these polynucleotides herein collectively referred to as "nervous system antigens," and antibodies that immunospecifically bind these polypeptides, and the use of such nervous system polynucleotides, antigens, and antibodies for detecting, treating, preventing and/or prognosing disorders of the nervous system, including, but not limited to, the presence of cancers of the nervous system and metastases of nervous system cancers. More specifically, isolated nervous system nucleic acid molecules are provided encoding novel nervous system polypeptides. Novel nervous system polypeptides and antibodies that bind to these polypeptides are provided. Also provided are vectors, host cells, and recombinant and synthetic methods for producing human nervous system polynucleotides, polypeptides, and/or antibodies. The invention further relates to diagnostic and therapeutic methods

useful for diagnosing, treating, preventing and/or prognosing disorders related to the nervous system, including cancers of the nervous system, and therapeutic methods for treating such disorders. The invention further relates to screening methods for identifying agonists and antagonists of polynucleotides and polypeptides of the invention. The invention further relates to methods and/or compositions for inhibiting or promoting the production and/or function of the polypeptides of the invention.

Background of the Invention

[004] The brain is the control center of the body, encoding such functions as the ability to move, touch, taste, smell, hear, and see, for example. It reviews all stimuli, whether from internal organs or the surface of the body, and generates a reaction, such as movement of the limbs, adjustment of the rate at which internal organs function, and/or alteration of mood. Stimuli and reactions are transmitted to and from the brain via the spinal cord, a collection of nerves encased within bony vertebrae. Both the brain and spinal cord are wrapped in three layers of tissue, collectively called the meninges, which provide cushioning and protection. Together, these components make up the central nervous system (CNS).

[005] The human brain is subdivided into three major segments: the brain stem, midbrain, and forebrain. The brain stem is considered to be the seat of the "primitive brain". It comprises such structures as the medulla and cerebellum, which control basic functions like breathing, heart rate, and digestion and the coordination of the senses and muscle movement, respectively. Many of these features are homologous across species. The midbrain controls many sensory and motor functions, including eye movement, and links the brain stem to such structures as the thalamus (for information relay) and hypothalamus (which is instrumental in regulating autonomic functions, like maintaining body temperature, regulating water balance, and controlling sleep). The forebrain is associated with the "high-level" functions of complex organisms. This area includes specialized regions for the control of skilled motor behaviors (e.g., speech, mood, thought, and planning for the future), interpretation of sensory input from the rest of the body, control of voluntary body movements, interpretation of vision, retrieval of long-term memories, recognition of familiar objects, and initiation of communication or action.

[006] Despite being encapsulated in the thick, hard bones of the skull, the brain is susceptible to many kinds of injury. Common injuries resulting from head trauma include herniation, edema, hematomas (subdural and epidural) , amnesia, coma, stupor, delirium, persistent or chronic vegetative state, concussion and post-concussion syndrome, cerebral contusions, damage to specific brain areas (e.g., the aphasia, apraxia, agnosia, and amnesia), and posttraumatic epilepsy. Bacteria and other infectious organisms can reach the CNS in through the blood stream or by penetration through an injury or surgery wound, leading to several serious diseases, such as bacterial meningitis, Waterhouse-Friderichsen syndrome, chronic meningitis, viral meningitis (e.g., lymphocytic choriomeningitis), bacterial meningitis (e.g., Haemophilus, Listeria, Meningococcal, pneumococcal, or meningeal tuberculosis), encephalitis, encephalomyelitis, Hallervorden-Spatz syndrome, aseptic meningitis, parainfectious encephalitis, subacute sclerosing panencephalitis, brain abscesses, AIDS dementia complex, Japanese encephalitis, St. Louis encephalitis, Tick-borne encephalitis, West Nile Fever encephalitis, postencephalitic Parkinson disease, necrotizing hemorrhagic encephalomyelitis, visna, cerebral malaria, neurosyphilis (e.g., tabes dorsalis), subdural empyema, cysticercosis, schistosomiasis, echinococcosis, coenurosis, cerebral toxoplasmosis, and prion diseases (e.g., Creutzfeldt-Jakob syndrome, bovine spongiform encephalopathy, Gerstmann-Straussler syndrome, kuru, or scrapie). Other brain diseases include hydrocephalus (e.g., Dandy-Walker syndrome or normal pressure hydrocephalus), Rhett syndrome, Reye's syndrome, pseudotumor cerebri, intracranial tuberculoma, Zellweger syndrome, narcolepsy, cataplexy, and cerebellar diseases. The spinal cord is equally susceptible to injury and disease, which can result in cervical spondylosis, cysts, acute transverse myelitis, spinal hematoma, nerve root disorders (e.g., sciatica, spinal stenosis, and shingles), ruptured disk, and spinal cord compression. Together, this illustrates the relative frailty of the CNS.

[007] The peripheral nervous system (PNS) includes all nerves outside the CNS: the cranial nerves that connect the head and face directly to the brain, the nerves that connect the eyes and nose to the brain, and all the nerves that connect the spinal cord to the rest of the body. The brain communicates with much of the body through the thirty-one pairs of spinal nerves that emerge from the spinal cord. Each pair includes one nerve at the front of the spinal cord, which carries information from the brain to

the muscles, and one nerve located at the back of the spinal cord, which carries sensory information to the brain. Peripheral nerves are actually bundles of nerve fibers – some of which are very small (less than 1/64 of an inch in diameter) and others are quite large. Large fibers convey the messages that activate muscles (motor nerves) and the sensations of touch and position (sensory nerves), whereas small fibers convey sensations of pain and temperature and control the automatic functions of the body, such as heart rate and blood pressure (autonomic nerves).

[008] Like the CNS, damage to the PNS results in several known disease states with effects seen throughout the body. Disorders of muscle stimulation include amyotrophic lateral sclerosis, progressive muscular atrophy, progressive bulbar palsy, Werdnig-Hoffman disease, intermediate spinal muscular atrophy, infantile and juvenile muscular atrophy, poliomyelitis and the post polio syndrome, primary lateral sclerosis, Wohlfart-Kugelberg-Welander disease, and progressive pseudobulbar palsy. Malfunction of the cranial nerves that lead directly from the brain to various parts of the head also results in several known disorders, such as trigeminal neuralgia, glossopharyngeal neuralgia, and Bell's palsy. Other diseases of the PNS include plexus disorders (e.g., acute brachial neuritis), thoracic outlet syndromes, mononeuropathy (e.g., carpal tunnel syndrome, leprosy, ulnar nerve palsy, radial nerve palsy, and peroneal nerve palsy), multiple mononeuropathy, polyneuropathy (e.g., chronic polyneuropathy and diabetic neuropathy), Guillain-Barre syndrome, and hereditary neuropathies (e.g., Charcot-Marie-Tooth disease and Dejerine-Sottas disease).

[009] Nerve cells are the fundamental elements of both the CNS and PNS. In total, there are an estimated 100 billion neurons in a human body. While neurons are similar to other cells of the body in their general organization, they also possess highly specialized and unique features which are critical to the function of the nervous system. Each neuron is comprised of four distinct regions: the cell body, a single axon, dendrites, and axon terminals. The cell body contains the nucleus and other organelles necessary for the life and functioning of the neuron. The dendrites are processes that extend outward from the cell body and receive signals from sensory organs or from other neurons. In the dendrites, incoming signals are converted to electrical impulses and transmitted to the cell body for processing. A single axon

extends from the cell body, which conducts information from the cell body to organs, muscles, or other neurons. At the end of the axon is an array of axon termini. These termini are the transmitting elements of a neuron. By means of these termini, an axon is able to transmit information to the receptive surfaces (typically the dendrites or the cell body) of other neurons or muscle cells.

[010] Other cellular structures crucial for neural transmission are the cytoskeletal fibers, including microtubules and neurofilaments, which run the length of the axon and function in transporting proteins, vesicles, and other macromolecules to the axon terminal. Additionally, some axons are surrounded by a myelin sheath made up of membranes from either oligodendrocyte cells (CNS) or Schwann cells (PNS). Myelinated axons conduct electrical impulses faster than unmyelinated ones of the same diameter. Damage to the myelin sheath has been associated with several known disease states, including multiple sclerosis, acute disseminated encephalomyelitis, Canavan disease, diffuse cerebral sclerosis, encephalitis periaxialis, global cell leukodystrophy, metachromatic leukodystrophy, allergic encephalomyelitis, necrotizing hemorrhagic encephalomyelitis, progressive multifocal leukoencephalopathy, central pontine myelinolysis, transverse myelinolysis, neuromyelitis optica, scrapie, swayback, adrenoleukodystrophy, adrenomyeloneuropathy, Leber's hereditary optic atrophy, and HTLV-associated myelopathy.

[011] Contact between neurons occurs at a specialized site called a synapse. At this site, the axon terminal from one neuron (the presynaptic cell) sends a signal to another neuron (the postsynaptic cell). Synapses may be connected either electrically or chemically. An electrical synapse consists of gap junctions that directly connect two neurons. This allows electrical signals to pass unabated from the presynaptic to postsynaptic neuron.

[012] The electrical signals are produced by temporary changes in the current flow into and out of the cell. Ion channels embedded in the membrane regulate current flow by selectively regulating the passage of a specific ion or ions across the membrane. There are two types of ion channels found in neural membranes – gated and non-gated. Non-gated channels are always open and are not significantly influenced by changes in external factors. These ion channels primarily function in maintaining the resting

membrane potential, or electrical potential across the membrane, of the neuron. Gated channels, in contrast, exist in two stable conformations – open and closed. Most gated channels are closed when the membrane is at its resting potential, and open when stimulated by external factors such as a change in membrane potential, ligand binding, or membrane stretch. Agonists, antagonists, and antibodies that bind to or block ion channels are extremely useful tools for studying brain function, which could lead to significant advances in understanding disease and the development of therapies. For example, tetrodotoxin (TTX), isolated from the poison sacks of the puffer fish, selectively blocks the voltage-gated sodium channels necessary for producing an excitatory electrical potential. This provides the researcher with a powerful tool for studying the effects of activity blockade on such processes as neural network development, learning and memory.

[013] In chemical synapses, the axon termini of the presynaptic cell contain vesicles filled with a particular molecule (neurotransmitter). An electrical signal from the cell body travels down the axon to the axon termini, where it triggers the release of neurotransmitter from the vesicle by exocytosis. The neurotransmitter rapidly diffuses across the synaptic cleft separating the presynaptic from the postsynaptic neuron. The neurotransmitter then binds to receptors located on the dendrites of the postsynaptic neuron, which open ion channels and provokes a change in the cell's electric potential. This change in electrical potential prompts further transmission of the signal.

[014] Signal transmission between a neuron and muscle cell occurs via a similar mechanism. At the neuromuscular junction, axon termini reside adjacent to muscle cells within depressions formed in the motor end-plate. An electrical signal prompts the release of neurotransmitter from axon termini, which diffuses across the synaptic cleft and binds to receptors located on the surface of the muscle cell. Binding of neurotransmitter provokes an electrical response that stimulates contraction of the muscle. Dysfunction of the neuromuscular junction plays a role in several neurological disorders. For example, in myasthenia gravis the immune system produces antibodies that attack the neurotransmitter receptors located on the muscle, preventing neurotransmitter binding and muscle contraction. Additionally, these antibodies can also be transferred from mother to child through the placenta, resulting in a variation of the disease called neonatal myasthenia, whose symptoms typically

disappear shortly after birth. Other known neuromuscular junction disorders include Eaton-Lambert syndrome and botulism.

[015] Neurotransmitters comprise a diverse group of small molecules, such as L-glutamine and acetylcholine, or peptides like enkephalin (McCance and Huenner, Pathophysiology, the Biological Basis for Disease in Adults and Humans, 2nd edition, pp.403-404 (1994)). Neurotransmitters are synthesized within the cell body of the presynaptic neuron and transported to the axon termini in vesicles, where they reside until exocytosed. The effects of neurotransmitters can be excitatory (e.g. initiation of neuron stimulation) or inhibitory (e.g., to hyperpolarize the plasma membrane and inhibit signal transmission). Many neurotransmitters are capable of eliciting either an excitatory or inhibitory response, dependent on the number and type of receptors located on the postsynaptic neuron.

[016] Current medical research efforts have identified a role for neurotransmitters and their receptors as targets of pharmacological agents aimed at controlling neurological function. For example, sedatives, such as benzodiazepines and barbituates, mimic the effect of the neurotransmitter GABA, which is known to be the primary inhibitory neurotransmitter in the CNS (Katzung, Basic and Clinical Pharmacology, 6th edition, 338-339 (1995)). The aberrant activity of neurotransmitters and their receptors has been linked to a number of neurological disorders, including Alzheimer's disease, Parkinson's disease, epilepsy, stroke, and myasthenia gravis (Planells-Cases et al., PNAS 90: 5057-5061 (1993)), identifying an important need for the discovery of novel polypeptides, agonists, antagonists, and corresponding to neurotransmitters.

[017] In adult humans, each neuron is connected to approximately ten thousand other neurons (Tessier-Lavigne et al., Science 274: 1123-1133 (1996)). While the overall program for determining which neurons should be connected together is under genetic control, it is external stimuli from sensory neurons that are crucially important in determining what network connections are actually made. To clarify, precise neural wiring is not fully developed at birth, but only roughly approximates the final network required to be fully functional. During embryonic development, neural connections are initiated via the programmed extension of axons, tipped at the leading end with a growth cone that is guided by molecular cues. Throughout post-natal development, this coarse pattern of connections is refined based on specific interactions between the

organism and its environment – essentially, through learning. This process can be modulated by normal and aberrant experiences, both having a more profound effect during early stages of postnatal development than in adulthood.

[018] Several changes occur in the brain throughout aging. Gross changes include decreases in brain weight, the production of certain proteins, and the total number of neurons in many brain regions. Additionally, there are age-related alterations in the synthesis and degradation of neurotransmitters and their receptors that are believed to cause some of the characteristics of senescence: changes in sleep patterns, mood, appetite, neuroendocrine functions, motor activity, and memory. While these changes are considered normal, a number of diseases have been identified that result from aberrant age-related changes, such as Alzheimer's disease, Parkinson's disease, Huntington's disease, Pick's disease, and dementia.

[019] The discovery of new human nervous system associated polynucleotides, the polypeptides encoded by them, and antibodies that immunospecifically bind these polypeptides, satisfies a need in the art by providing new compositions which are useful in the diagnosis, treatment, prevention and/or prognosis of disorders of the nervous system, including, but not limited to, neuropsychiatric disorders, neurodegenerative diseases, vascular disorders, developmental disorders, infections, and neoplastic disorders.

Summary of the Invention

[020] The present invention relates to novel nervous system related polynucleotides, the polypeptides encoded by these polynucleotides herein collectively referred to as "nervous system antigens," and antibodies that immunospecifically bind these polypeptides, and the use of such nervous system polynucleotides, antigens, and antibodies for detecting, treating, preventing and/or prognosing disorders of the nervous system, including, but not limited to, the presence of cancers of the nervous system and metastases of cancers of the nervous system. More specifically, isolated nervous system nucleic acid molecules are provided encoding novel nervous system polypeptides. Novel nervous system polypeptides and antibodies that bind to these

polypeptides are provided. Also provided are vectors, host cells, and recombinant and synthetic methods for producing human nervous system polynucleotides, polypeptides, and/or antibodies. The invention further relates to diagnostic and therapeutic methods useful for diagnosing, treating, preventing and/or prognosing disorders related to the nervous system, including cancers of the nervous system, and therapeutic methods for treating such disorders. The invention further relates to screening methods for identifying agonists and antagonists of polynucleotides and polypeptides of the invention. The invention further relates to methods and/or compositions for inhibiting or promoting the production and/or function of the polypeptides of the invention.

Detailed Description

Tables

[021] Table 1A summarizes some of the polynucleotides encompassed by the invention (including cDNA clones related to the sequences (Clone ID NO:Z), contig sequences (contig identifier (Contig ID:) and contig nucleotide sequence identifier (SEQ ID NO:X)) and further summarizes certain characteristics of these polynucleotides and the polypeptides encoded thereby. The first column provides a unique clone identifier, "Clone ID NO:Z", for a cDNA plasmid related to each nervous system associated contig sequence disclosed in Table 1A. The second column provides a unique contig identifier, "Contig ID:" for each of the contig sequences disclosed in Table 1A. The third column provides the sequence identifier, "SEQ ID NO:X", for each of the contig polynucleotide sequences disclosed in Table 1A. The fourth column, "ORF (From-To)", provides the location (i.e., nucleotide position numbers) within the polynucleotide sequence of SEQ ID NO:X that delineate the preferred open reading frame (ORF) shown in the sequence listing and referenced in Table 1A as SEQ ID NO:Y (column 5). Column 6 lists residues comprising predicted epitopes contained in the polypeptides encoded by each of the preferred ORFs (SEQ ID NO:Y). Identification of potential immunogenic regions was performed according to the method of Jameson and Wolf (CABIOS, 4:181-186 (1988)); specifically, the Genetics Computer Group (GCG) implementation of this algorithm, embodied in the program PEPTIDESTRUCTURE (Wisconsin Package v10.0, Genetics Computer Group (GCG), Madison, Wisc.). This method returns a measure of the probability that a given

residue is found on the surface of the protein. Regions where the antigenic index score is greater than 0.9 over at least 6 amino acids are indicated in Table 1A as "Predicted Epitopes." In particular embodiments, nervous system associated polypeptides of the invention comprise, or alternatively consist of, one, two, three, four, five or more of the predicted epitopes described in Table 1A. It will be appreciated that depending on the analytical criteria used to predict antigenic determinants, the exact address of the determinant may vary slightly. Column 7, "Tissue Distribution" shows the expression profile of tissue, cells, and/or cell line libraries which express the polynucleotides of the invention. The first number in column 7 (preceding the colon), represents the tissue/cell source identifier code corresponding to the code and description provided in Table 4. Expression of these polynucleotides was not observed in the other tissues and/or cell libraries tested. For those identifier codes in which the first two letters are not "AR", the second number in column 7 (following the colon), represents the number of times a sequence corresponding to the reference polynucleotide sequence (e.g., SEQ ID NO:X) was identified in the tissue/cell source. Those tissue/cell source identifier codes in which the first two letters are "AR" designate information generated using DNA array technology. Utilizing this technology, cDNAs were amplified by PCR and then transferred, in duplicate, onto the array. Gene expression was assayed through hybridization of first strand cDNA probes to the DNA array. cDNA probes were generated from total RNA extracted from a variety of different tissues and cell lines. Probe synthesis was performed in the presence of ^{33}P dCTP, using oligo(dT) to prime reverse transcription. After hybridization, high stringency washing conditions were employed to remove non-specific hybrids from the array. The remaining signal, emanating from each gene target, was measured using a Phosphorimager. Gene expression was reported as Phosphor Stimulating Luminescence (PSL) which reflects the level of phosphor signal generated from the probe hybridized to each of the gene targets represented on the array. A local background signal subtraction was performed before the total signal generated from each array was used to normalize gene expression between the different hybridizations. The value presented after "[array code]:" represents the mean of the duplicate values, following background subtraction and probe normalization. One of skill in the art could routinely use this information to identify normal and/or diseased

tissue(s) which show a predominant expression pattern of the corresponding polynucleotide of the invention or to identify polynucleotides which show predominant and/or specific tissue and/or cell expression. Column 8, "Cytologic Band," provides the chromosomal location of polynucleotides corresponding to SEQ ID NO:X. Chromosomal location was determined by finding exact matches to EST and cDNA sequences contained in the NCBI (National Center for Biotechnology Information) UniGene database. Given a presumptive chromosomal location, disease locus association was determined by comparison with the Morbid Map, derived from Online Mendelian Inheritance in Man (Online Mendelian Inheritance in Man, OMIM™. McKusick-Nathans Institute for Genetic Medicine, Johns Hopkins University (Baltimore, MD) and National Center for Biotechnology Information, National Library of Medicine (Bethesda, MD) 2000. World Wide Web URL: <http://www.ncbi.nlm.nih.gov/omim/>). If the putative chromosomal location of the Query overlapped with the chromosomal location of a Morbid Map entry, an OMIM identification number is provided in Table 1A, column 9 labeled "OMIM Disease Reference(s)". A key to the OMIM reference identification numbers is provided in Table 5.

[022] Table 1B summarizes additional polynucleotides encompassed by the invention (including cDNA clones related to the sequences (Clone ID NO:Z), contig sequences (contig identifier (Contig ID:) contig nucleotide sequence identifiers (SEQ ID NO:X)), and genomic sequences (SEQ ID NO:B). The first column provides a unique clone identifier, "Clone ID NO:Z", for a cDNA clone related to each contig sequence. The second column provides the sequence identifier, "SEQ ID NO:X", for each contig sequence. The third column provides a unique contig identifier, "Contig ID:" for each contig sequence. The fourth column, provides a BAC identifier "BAC ID NO:A" for the BAC clone referenced in the corresponding row of the table. The fifth column provides the nucleotide sequence identifier, "SEQ ID NO:B" for a fragment of the BAC clone identified in column four of the corresponding row of the table. The sixth column, "Exon From-To", provides the location (i.e., nucleotide position numbers) within the polynucleotide sequence of SEQ ID NO:B which delineate certain polynucleotides of the invention that are also exemplary members of polynucleotide sequences that encode polypeptides of the invention (e.g., polypeptides containing

amino acid sequences encoded by the polynucleotide sequences delineated in column six, and fragments and variants thereof).

[023] Table 2 summarizes homology and features of some of the polypeptides of the invention. The first column provides a unique clone identifier, "Clone ID NO:Z", corresponding to a cDNA disclosed in Table 1A. The second column provides the unique contig identifier, "Contig ID:" corresponding to contigs in Table 1A and allowing for correlation with the information in Table 1A. The third column provides the sequence identifier, "SEQ ID NO:X", for the contig polynucleotide sequences. The fourth column provides the analysis method by which the homology/identity disclosed in the row was determined. Comparisons were made between polypeptides encoded by the polynucleotides of the invention and either a non-redundant protein database (herein referred to as "NR"), or a database of protein families (herein referred to as "PFAM") as further described below. The fifth column provides a description of PFAM/NR hits having significant matches to a polypeptide of the invention. Column six provides the accession number of the PFAM/NR hit disclosed in the fifth column. Column seven, "Score/Percent Identity", provides a quality score or the percent identity, of the hit disclosed in column five. Columns 8 and 9, "NT From" and "NT To" respectively, delineate the polynucleotides in "SEQ ID NO:X" that encode a polypeptide having a significant match to the PFAM/NR database as disclosed in the fifth column. In specific embodiments, polypeptides of the invention comprise, or alternatively consist of, an amino acid sequence encoded by the polynucleotides in SEQ ID NO:X as delineated in columns 8 and 9, or fragments or variants thereof.

[024] Table 3 provides polynucleotide sequences that may be disclaimed according to certain embodiments of the invention. The first column provides a unique clone identifier, "Clone ID NO:Z", for a cDNA clone related to nervous system associated contig sequences disclosed in Table 1A. The second column provides the sequence identifier, "SEQ ID NO:X", for contig polynucleotide sequences disclosed in Table 1A. The third column provides the unique contig identifier, "Contig ID", for contigs disclosed in Table 1A. The fourth column provides a unique integer 'a' where 'a' is any integer between 1 and the final nucleotide minus 15 of SEQ ID NO:X, represented as "Range of a", and the fifth column provides a unique integer 'b' where 'b' is any integer between 15 and the final nucleotide of SEQ ID NO:X, represented as "Range

of b", where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:X, and where b is greater than or equal to a + 14. For each of the polynucleotides shown as SEQ ID NO:X, the uniquely defined integers can be substituted into the general formula of a-b, and used to describe polynucleotides which may be preferably excluded from the invention. In certain embodiments, preferably excluded from the polynucleotides of the invention (including polynucleotide fragments and variants as described herein and diagnostic and/or therapeutic uses based on these polynucleotides) are at least one, two, three, four, five, ten, or more of the polynucleotide sequence(s) having the accession number(s) disclosed in the sixth column of this Table (including for example, published sequence in connection with a particular BAC clone). In further embodiments, preferably excluded from the invention are the specific polynucleotide sequence(s) contained in the clones corresponding to at least one, two, three, four, five, ten, or more of the available material having the accession numbers identified in the sixth column of this Table (including for example, the actual sequence contained in an identified BAC clone).

[025] Table 4 provides a key to the tissue/cell source identifier code disclosed in Table 1A, column 7. Column 1 provides the key to the tissue/cell source identifier code disclosed in Table 1A, Column 7. Columns 2-5 provide a description of the tissue or cell source. Codes corresponding to diseased tissues are indicated in column 6 with the word "disease". The use of the word "disease" in column 6 is non-limiting. The tissue or cell source may be specific (e.g. a neoplasm), or may be disease-associated (e.g., a tissue sample from a normal portion of a diseased organ). Furthermore, tissues and/or cells lacking the "disease" designation may still be derived from sources directly or indirectly involved in a disease state or disorder, and therefore may have a further utility in that disease state or disorder. In numerous cases where the tissue/cell source is a library, column 7 identifies the vector used to generate the library.

[026] Table 5 provides a key to the OMIM™ reference identification numbers disclosed in Table 1A, column 9. OMIM reference identification numbers (Column 1) were derived from Online Mendelian Inheritance in Man (Online Mendelian Inheritance in Man, OMIM™. McKusick-Nathans Institute for Genetic Medicine, Johns Hopkins University (Baltimore, MD) and National Center for Biotechnology Information, National Library of Medicine, (Bethesda, MD) 2000. World Wide Web URL:

<http://www.ncbi.nlm.nih.gov/omim/>). Column 2 provides diseases associated with the cytologic band disclosed in Table 1A, column 8, as determined from the Morbid Map database.

[027] Table 6 summarizes ATCC Deposits, Deposit dates, and ATCC designation numbers of deposits made with the ATCC in connection with the present application.

[028] Table 7 shows the cDNA libraries sequenced, tissue source description, vector information and ATCC designation numbers relating to these cDNA libraries.

[029] Table 8 provides a physical characterization of clones encompassed by the invention. The first column provides the unique clone identifier, "Clone ID NO:Z", for certain cDNA clones of the invention, as described in Table 1A. The second column provides the size of the cDNA insert contained in the corresponding cDNA clone.

Definitions

[030] The following definitions are provided to facilitate understanding of certain terms used throughout this specification.

[031] In the present invention, "isolated" refers to material removed from its original environment (e.g., the natural environment if it is naturally occurring), and thus is altered "by the hand of man" from its natural state. For example, an isolated polynucleotide could be part of a vector or a composition of matter, or could be contained within a cell, and still be "isolated" because that vector, composition of matter, or particular cell is not the original environment of the polynucleotide. The term "isolated" does not refer to genomic or cDNA libraries, whole cell total or mRNA preparations, genomic DNA preparations (including those separated by electrophoresis and transferred onto blots), sheared whole cell genomic DNA preparations or other compositions where the art demonstrates no distinguishing features of the polynucleotide sequences of the present invention.

[032] As used herein, a "polynucleotide" refers to a molecule having a nucleic acid sequence encoding SEQ ID NO:Y or a fragment or variant thereof, a nucleic acid sequence contained in SEQ ID NO:X (as described in column 3 of Table 1A) or the complement thereof, a cDNA sequence contained in Clone ID NO:Z (as described in column 1 of Table 1A and contained within a library deposited with the ATCC); a

nucleotide sequence encoding the polypeptide encoded by a nucleotide sequence in SEQ ID NO:B as defined in column 6 of Table 1B or a fragment or variant thereof; or a nucleotide coding sequence in SEQ ID NO:B as defined in column 6 of Table 1B or the complement thereof. For example, the polynucleotide can contain the nucleotide sequence of the full length cDNA sequence, including the 5' and 3' untranslated sequences, the coding region, as well as fragments, epitopes, domains, and variants of the nucleic acid sequence. Moreover, as used herein, a "polypeptide" refers to a molecule having an amino acid sequence encoded by a polynucleotide of the invention as broadly defined (obviously excluding poly-Phenylalanine or poly-Lysine peptide sequences which result from translation of a polyA tail of a sequence corresponding to a cDNA).

[033] As used herein, a "nervous system antigen" refers collectively to any polynucleotide disclosed herein (e.g., a nucleic acid sequence contained in SEQ ID NO:X or the complement thereof, or cDNA sequence contained in Clone ID NO:Z, or a nucleotide sequence encoding the polypeptide encoded by a nucleotide sequence in SEQ ID NO:B as defined in column 6 of Table 1B, or a nucleotide coding sequence in SEQ ID NO:B as defined in column 6 of Table 1B or the complement thereof and fragments or variants thereof as described herein) or any polypeptide disclosed herein (e.g., an amino acid sequence contained in SEQ ID NO:Y, an amino acid sequence encoded by SEQ ID NO:X, or the complement thereof, an amino acid sequence encoded by the cDNA sequence contained in Clone ID NO:Z, an amino acid sequence encoded by SEQ ID NO:B, or the complement thereof, and fragments or variants thereof as described herein). These nervous system antigens have been determined to be predominantly expressed in nervous system tissues, including normal or diseased tissues (as shown in Table 1A column 7 and Table 4).

[034] In the present invention, "SEQ ID NO:X" was often generated by overlapping sequences contained in multiple clones (contig analysis). A representative clone containing all or most of the sequence for SEQ ID NO:X is deposited at Human Genome Sciences, Inc. (HGS) in a catalogued and archived library. As shown, for example, in column 1 of Table 1A, each clone is identified by a cDNA Clone ID (identifier generally referred to herein as Clone ID NO:Z). Each Clone ID is unique to an individual clone and the Clone ID is all the information needed to retrieve a given

clone from the HGS library. Furthermore, certain clones disclosed in this application have been deposited with the ATCC on October 5, 2000, having the ATCC designation numbers PTA 2574 and PTA 2575; and on January 5, 2001, having the depositor reference numbers TS-1, TS-2, AC-1, and AC-2. In addition to the individual cDNA clone deposits, most of the cDNA libraries from which the clones were derived were deposited at the American Type Culture Collection (hereinafter "ATCC"). Table 7 provides a list of the deposited cDNA libraries. One can use the Clone ID NO:Z to determine the library source by reference to Tables 6 and 7. Table 7 lists the deposited cDNA libraries by name and links each library to an ATCC Deposit. Library names contain four characters, for example, "HTWE." The name of a cDNA clone (Clone ID NO:Z) isolated from that library begins with the same four characters, for example "HTWEP07". As mentioned below, Table 1A correlates the Clone ID NO:Z names with SEQ ID NO:X. Thus, starting with an SEQ ID NO:X, one can use Tables 1A, 6 and 7 to determine the corresponding Clone ID NO:Z, which library it came from and which ATCC deposit the library is contained in. Furthermore, it is possible to retrieve a given cDNA clone from the source library by techniques known in the art and described elsewhere herein. The ATCC is located at 10801 University Boulevard, Manassas, Virginia 20110-2209, USA. The ATCC deposits were made pursuant to the terms of the Budapest Treaty on the international recognition of the deposit of microorganisms for the purposes of patent procedure.

[035] In specific embodiments, the polynucleotides of the invention are at least 15, at least 30, at least 50, at least 100, at least 125, at least 500, or at least 1000 continuous nucleotides but are less than or equal to 300 kb, 200 kb, 100 kb, 50 kb, 15 kb, 10 kb, 7.5 kb, 5 kb, 2.5 kb, 2.0 kb, or 1 kb, in length. In a further embodiment, polynucleotides of the invention comprise a portion of the coding sequences, as disclosed herein, but do not comprise all or a portion of any intron. In another embodiment, the polynucleotides comprising coding sequences do not contain coding sequences of a genomic flanking gene (i.e., 5' or 3' to the gene of interest in the genome). In other embodiments, the polynucleotides of the invention do not contain the coding sequence of more than 1000, 500, 250, 100, 50, 25, 20, 15, 10, 5, 4, 3, 2, or 1 genomic flanking gene(s).

[036] A "polynucleotide" of the present invention also includes those polynucleotides capable of hybridizing, under stringent hybridization conditions, to sequences contained in SEQ ID NO:X, or the complement thereof (e.g., the complement of any one, two, three, four, or more of the polynucleotide fragments described herein), the polynucleotide sequence delineated in columns 8 and 9 of Table 2 or the complement thereof, and/or cDNA sequences contained in Clone ID NO:Z (e.g., the complement of any one, two, three, four, or more of the polynucleotide fragments, or the cDNA clone within the pool of cDNA clones deposited with the ATCC, described herein) and/or the polynucleotide sequence delineated in column 6 of Table 1B or the complement thereof. "Stringent hybridization conditions" refers to an overnight incubation at 42 degree C in a solution comprising 50% formamide, 5x SSC (750 mM NaCl, 75 mM trisodium citrate), 50 mM sodium phosphate (pH 7.6), 5x Denhardt's solution, 10% dextran sulfate, and 20 µg/ml denatured, sheared salmon sperm DNA, followed by washing the filters in 0.1x SSC at about 65 degree C.

[037] Also contemplated are nucleic acid molecules that hybridize to the polynucleotides of the present invention at lower stringency hybridization conditions. Changes in the stringency of hybridization and signal detection are primarily accomplished through the manipulation of formamide concentration (lower percentages of formamide result in lowered stringency), salt conditions, or temperature. For example, lower stringency conditions include an overnight incubation at 37 degree C in a solution comprising 6X SSPE (20X SSPE = 3M NaCl; 0.2M NaH_2PO_4 ; 0.02M EDTA, pH 7.4), 0.5% SDS, 30% formamide, 100 µg/ml salmon sperm blocking DNA; followed by washes at 50 degree C with 1XSSPE, 0.1% SDS. In addition, to achieve even lower stringency, washes performed following stringent hybridization can be done at higher salt concentrations (e.g. 5X SSC).

[038] Note that variations in the above conditions may be accomplished through the inclusion and/or substitution of alternate blocking reagents used to suppress background in hybridization experiments. Typical blocking reagents include Denhardt's reagent, BLOTTO, heparin, denatured salmon sperm DNA, and commercially available proprietary formulations. The inclusion of specific blocking reagents may require modification of the hybridization conditions described above, due to problems with compatibility.

[039] Of course, a polynucleotide which hybridizes only to polyA⁺ sequences (such as any 3' terminal polyA⁺ tract of a cDNA shown in the sequence listing), or to a complementary stretch of T (or U) residues, would not be included in the definition of "polynucleotide," since such a polynucleotide would hybridize to any nucleic acid molecule containing a poly (A) stretch or the complement thereof (e.g., practically any double-stranded cDNA clone generated using oligo dT as a primer).

[040] The polynucleotide of the present invention can be composed of any polyribonucleotide or polydeoxribonucleotide, which may be unmodified RNA or DNA or modified RNA or DNA. For example, polynucleotides can be composed of single- and double-stranded DNA, DNA that is a mixture of single- and double-stranded regions, single- and double-stranded RNA, and RNA that is mixture of single- and double-stranded regions, hybrid molecules comprising DNA and RNA that may be single-stranded or, more typically, double-stranded or a mixture of single- and double-stranded regions. In addition, the polynucleotide can be composed of triple-stranded regions comprising RNA or DNA or both RNA and DNA. A polynucleotide may also contain one or more modified bases or DNA or RNA backbones modified for stability or for other reasons. "Modified" bases include, for example, tritylated bases and unusual bases such as inosine. A variety of modifications can be made to DNA and RNA; thus, "polynucleotide" embraces chemically, enzymatically, or metabolically modified forms.

[041] The polypeptide of the present invention can be composed of amino acids joined to each other by peptide bonds or modified peptide bonds, i.e., peptide isosteres, and may contain amino acids other than the 20 gene-encoded amino acids. The polypeptides may be modified by either natural processes, such as posttranslational processing, or by chemical modification techniques which are well known in the art. Such modifications are well described in basic texts and in more detailed monographs, as well as in a voluminous research literature. Modifications can occur anywhere in a polypeptide, including the peptide backbone, the amino acid side-chains and the amino or carboxyl termini. It will be appreciated that the same type of modification may be present in the same or varying degrees at several sites in a given polypeptide. Also, a given polypeptide may contain many types of modifications. Polypeptides may be branched, for example, as a result of ubiquitination, and they may be cyclic, with or

without branching. Cyclic, branched, and branched cyclic polypeptides may result from posttranslation natural processes or may be made by synthetic methods. Modifications include acetylation, acylation, ADP-ribosylation, amidation, covalent attachment of flavin, covalent attachment of a heme moiety, covalent attachment of a nucleotide or nucleotide derivative, covalent attachment of a lipid or lipid derivative, covalent attachment of phosphatidylinositol, cross-linking, cyclization, disulfide bond formation, demethylation, formation of covalent cross-links, formation of cysteine, formation of pyroglutamate, formylation, gamma-carboxylation, glycosylation, GPI anchor formation, hydroxylation, iodination, methylation, myristoylation, oxidation, pegylation, proteolytic processing, phosphorylation, prenylation, racemization, selenoylation, sulfation, transfer-RNA mediated addition of amino acids to proteins such as arginylation, and ubiquitination. (See, for instance, PROTEINS - STRUCTURE AND MOLECULAR PROPERTIES, 2nd Ed., T. E. Creighton, W. H. Freeman and Company, New York (1993); POSTTRANSLATIONAL COVALENT MODIFICATION OF PROTEINS, B. C. Johnson, Ed., Academic Press, New York, pgs. 1-12 (1983); Seifter et al., Meth. Enzymol. 182:626-646 (1990); Rattan et al., Ann. N.Y. Acad. Sci. 663:48-62 (1992).)

[042] "SEQ ID NO:X" refers to a polynucleotide sequence described, for example, in Tables 1A or 2, while "SEQ ID NO:Y" refers to a polypeptide sequence described in column 5 of Table 1A. SEQ ID NO:X is identified by an integer specified in column 3 of Table 1A. The polypeptide sequence SEQ ID NO:Y is a translated open reading frame (ORF) encoded by polynucleotide SEQ ID NO:X. "Clone ID NO:Z" refers to a cDNA clone described in column 1 of Table 1A.

[043] "A polypeptide having biological activity" refers to a polypeptide exhibiting activity similar to, but not necessarily identical to, an activity of a polypeptide of the present invention, including mature forms, as measured in a particular biological assay, with or without dose dependency. In the case where dose dependency does exist, it need not be identical to that of the polypeptide, but rather substantially similar to the dose-dependence in a given activity as compared to the polypeptide of the present invention (i.e., the candidate polypeptide will exhibit greater activity or not more than about 25-fold less and, preferably, not more than about tenfold less activity,

and most preferably, not more than about three-fold less activity relative to the polypeptide of the present invention).

[044] Table 1A summarizes some of the polynucleotides encompassed by the invention (including contig sequences (SEQ ID NO:X) and clones (Clone ID NO:Z) and further summarizes certain characteristics of these polynucleotides and the polypeptides encoded thereby.

Polynucleotides and Polypeptides

TABLE 1A

Clone ID NO: Z	Contig ID:	SEQ ID NO: X	ORF (From-To)	AA SEQ ID NO: Y	Predicted Epitopes	Tissue Distribution Library code: count (see Table IV for Library Codes)	Cytologic Band	OMIM Disease Reference(s):
HADBF48	694915	11	59 - 247	3335		S0110: 2, L0438: 2, L0770: 1 and L0745: 1.		
HADBBH59	531380	12	2 - 109	3336		S0110: 2	11	
HADMA09	848972	13	77 - 202	3337		H0390: 2		
HADMA74	585493	14	302 - 168	3338		L0754: 2, H0390: 1, T0010: 1 and L0731: 1.		
HAGAA66	522798	15	122 - 220	3339		S0010: 1, H0194: 1 and L0766: 1.		
HAGAH19	672049	16	191 - 316	3340		S0222: 1, S0010: 1, L0747: 1, L0756: 1 and S0260: 1.		
HAGAH48	578305	17	145 - 306	3341		S0010: 2		
HAGAH77	578301	18	178 - 438	3342		S0010: 2		
HAGAL80	848859	19	734 - 925	3343	Thr-16 to Arg-21.	L0438: 3, S0346: 2, H0009: 2, S6016: 1, S0222: 1, S0010: 1, H0052: 1, S0050: 1, S0388: 1, S0036: 1 and L0794: 1.		
HAGAN40	585410	20	28 - 303	3344	Arg-11 to Lys-24, Ser-48 to Glu-69.	S0010: 3		
HAGAN51	712782	21	295 - 447	3345		S0010: 2		
HAGAX70	715375	22	97 - 29	3346	Asp-4 to Asp-12.	S0010: 2		
HAGBK33	530431	23	5 - 142	3347	Glu-21 to Leu-35.	S0010: 2		

HAGBK78	760302	24	548 - 727	3348			L0439: 4, S0010: 2, H0051: 1 and H0100: 1.		
HAGBM60	735118	25	3 - 71	3349			S0010: 2		
HAGBQ28	507336	26	134 - 232	3350			S0010: 2		
HAGBV83	525851	27	3 - 227	3351			S0010: 2 and L0748: 1.		
HAGBX62	530278	28	3 - 146	3352			S0010: 2		
HAGCB09	578062	29	94 - 249	3353			S0010: 2		
HAGCB32	519573	30	142 - 303	3354			S0010: 3, L0803: 2 and L0809: 1.		
HAGCC42	935310	31	2 - 136	3355			S0010: 1 and S0260: 1.		
HAGCE06	960592	32	1 - 216	3356	Pro-24 to Val-29, Asp-37 to His-43, Lys-58 to Asn-66.		S0010: 2		
HAGCE07	954244	33	117 - 350	3357	Ser-1 to Gly-7.		S6026: 1, S0010: 1 and S0346: 1.		
HAGCF46	530276	34	59 - 271	3358	Glu-1 to Lys-8, Asp-19 to Pro-30, Ile-33 to Cys-40.		S0010: 2 and L0766: 2.		
HAGCM32	850473	35	232 - 402	3359	Pro-38 to Arg-50.		H0052: 3, S6024: 1, H0261: 1 and S0010: 1.		
HAGCM64	671389	36	96 - 389	3360	Trp-1 to Trp-11, Asp-17 to Cys-24.		H0051: 3, S0036: 2, S0035: 1, S0010: 1 and S0260: 1.		
HAGCS70	530265	37	54 - 245	3361			S0010: 2		
HAGCV72	661535	38	20 - 133	3362	Gln-6 to Trp-13.		S0010: 1, S0346: 1, L0770: 1 and L0790: 1.		
HAGCX13	966686	39	22 - 372	3363			L0742: 3, L0769: 2, S6024: 1, S0222: 1,		

									S0010: 1, S0038: 1, L0768: 1, L0794: 1 and L0790: 1.			
HAGCY44	716716	40	3 - 95	3364					S0010: 1 and S0346: 1.			
HAGCZ78	772822	41	676 - 927	3365	Ser-8 to Tyr-13, Pro-29 to Ser-36.				L0439: 2, L0759: 2, S0010: 1 and H0052: 1.			
HAGDB58	681932	42	98 - 244	3366	Ser-1 to Tyr-6, Pro-24 to Asn-31.				S0010: 3, S0007: 1 and S0346: 1.			
HAGDD86	916768	43	1 - 345	3367	Trp-35 to Thr-41.				S0010: 3			
HAGDE71	760459	44	15 - 188	3368					S0010: 2			
HAGDH10	964832	45	2 - 262	3369	Leu-33 to Cys-40.				S0010: 2 and L0770: 2.			
HAGDN43	576355	46	85 - 237	3370	Gly-1 to Ala-13, Ser-21 to Trp-26.				S0010: 2			
HAGDO14	526655	47	16 - 417	3371	Pro-17 to Arg-25.				H0009: 3 and S0010: 1.			
HAGDO19	909995	48	2 - 514	3372	Arg-1 to Ser-9, Pro-16 to Cys-21, Ala-26 to Asp-40, Pro-83 to Gln-89.				AR061: 0, AR089: 0 2 L0794: 7, S0010: 3, H0052: 2, S0222: 1, H0438: 1, S0665: 1, S0036: 1, S0038: 1, L0594: 1 and L0096: 1.			
HAGDT85	578128	49	3 - 200	3373	Thr-6 to Cys-13, His-16 to Gly-21, Ser-32 to Arg-39, Glu-54 to Ser-66.				T0082: 1 and S0010: 1.			
HAGDU23	960248	50	3 - 365	3374	Gly-16 to Ser-22, Pro-33 to Asn-39, Leu-75 to Asn-80.				L0742: 13, L0439: 6, L0438: 3, S0010: 2, S6028: 2, L0756: 2, S0346: 1, S0051: 1,			

HAGDV46	576334	51	35 - 325	3375	Thr-12 to Arg-21.	T0010: 1 and L0789: 1.		
HAGDX45	578644	52	2 - 133	3376	Asn-14 to Asn-21, Phe-26 to Ser-40.	S0010: 2 S0010: 1 and T0010: 1.		
HAGDY53	878471	53	51 - 668	3377	Pro-17 to His-22, Pro-27 to Gly-32, Glu-62 to Arg-72.	S0222: 1, T0082: 1, S0010: 1 and S6028: 1.		
HAGDZ16	662063	54	1 - 189	3378		S0010: 1 and S0346: 1.	20q12-q13	600281, 600281
HAGEA58	835626	55	3 - 374	3379	Thr-22 to Tyr-31.	S0010: 2, L0769: 2, L0803: 2, L0521: 1 and L0792: 1.		
HAGBC14	658552	56	2 - 202	3380		L0747: 2, S6024: 1, S0010: 1, L0646: 1, L0766: 1 and L0665: 1.		
HAGED01	913677	57	86 - 379	3381		S0007: 1 and S0010: 1.		
HAGED70	576337	58	118 - 201	3382		S0010: 2		
HAGEF07	953547	59	113 - 328	3383		S0010: 1 and S0346: 1.		
HAGEH51	954889	60	148 - 414	3384		S0010: 2, L0753: 1 and L0592: 1.		
HAGEK04	694464	61	2 - 235	3385		S0010: 2		
HAGEL88	661398	62	580 - 837	3386		L0756: 2, S0010: 1, S0388: 1, S0036: 1, L0638: 1, L0438: 1, L0355: 1, L0439: 1 and L0740: 1.		
HAGEN17	576665	63	173 - 274	3387		S0001: 1 and S0010: 1.		
HAGEP22	576303	64	3 - 212	3388	His-1 to Ser-6,	S0010: 2		

							Asn-19 to Ser-25, Gly-50 to Cys-57, Tyr-64 to Ser-70.				
HAGEP85	883841	65	3 - 356	3389			Ser-2 to Gly-8.		S0010: 2		
HAGER03	924599	66	28 - 306	3390					S0010: 2		
HAGER07	953546	67	3 - 236	3391			Ser-10 to Ser-28.		S0010: 2		
HAGER65	576805	68	252 - 455	3392			Val-25 to Trp-32.		S0010: 1 and S0050: 1.		
HAGEV41	694705	69	1 - 279	3393					S0010: 2		
HAGEY22	826123	70	110 - 343	3394			Ile-7 to Asn-19.		S0010: 2		
HAGEZ39	578306	71	180 - 305	3395			Trp-19 to Lys-33.		S0010: 2		
HAGEZ72	578053	72	50 - 172	3396			Leu-12 to Arg-17, Gly-24 to Arg-41.		S0010: 2		
HAGFB66	791951	73	71 - 301	3397			Glu-7 to Gln-16, Arg-24 to Arg-31, Gly-52 to Gly-58.		S0010: 2		
HAGFE37	705797	74	347 - 162	3398			Val-17 to Lys-22, Glu-40 to Pro-52.		S6024: 1, S0010: 1, L0744: 1 and L0439: 1.		
HAGFJ61	578296	75	138 - 299	3399			Glu-6 to Val-12, Thr-14 to Val-22, Ala-31 to Pro-49.		S0010: 2		
HAGFM28	705808	76	304 - 471	3400					S0222: 2, S0010: 1, S0346: 1, L0438: 1 and L0439: 1.		
HAGFO78	950715	77	1 - 951	3401			Leu-1 to His-8.		S0010: 2, L0438: 2, L0439: 2 and H0566: 1.		
HAGFO86	935711	78	2 - 268	3402			Arg-13 to Phe-22, Asn-24 to Ala-31, Glu-48 to Tyr-60.		S0010: 2		

HAGFS07	835924	79	443 - 682	3403	Pro-20 to Asn-26.	H0442: 1 and S0010: 1.	
HAGFT60	578082	80	177 - 332	3404	Pro-10 to Ser-15.	S0010: 2	
HAGFV82	522990	81	591 - 848	3405		S0010: 2 and H0051: 1.	
HAGFW44	715865	82	31 - 243	3406	His-38 to Ser-52.	S0010: 3, L0770: 3, L0439: 3, L0438: 2, L0777: 2, L0630: 1, L0764: 1, L0794: 1, L0352: 1 and L0743: 1.	
HAGGB28	686101	83	47 - 220	3407		S0346: 2	
HAGGC20	913640	84	304 - 480	3408	Phe-15 to Ser-24.	L0439: 3, L0438: 2, H0229: 1, S0665: 1, S0346: 1, S0049: 1 and L0366: 1.	
HAGGU27	682713	85	184 - 315	3409		S0346: 2	
HAGGU63	744725	86	3 - 155	3410	Ala-5 to Leu-11.	S0346: 2	
HAGHB19	668285	87	1 - 177	3411	Gln-25 to Phe-32.	S0010: 1 and S0346: 1.	
HAGHC02	919181	88	107 - 259	3412		S0346: 1 and H0009: 1.	
HAGHE63	744722	89	5 - 307	3413	Pro-22 to Gly-28, Gly-37 to Gln-42, Asn-71 to Tyr-82.	S0346: 2	
HAGHR11	848869	90	34 - 369	3414		L0005: 1, S0010: 1 and S0346: 1.	
HAGHR85	764560	91	242 - 373	3415	Asn-38 to Asp-44.	L0439: 4, S0400: 1, S0346: 1, H0374: 1 and S0260: 1.	
HAGHZ04	927382	92	3 - 254	3416		S0346: 2	
HAGID05	930784	93	326 - 496	3417	Pro-4 to Lys-29.	S0346: 2	
HAGII06	933845	94	1 - 537	3418	Ser-12 to Gly-18,	L0439: 2, S0665: 1,	

						Thr-31 to Gly-39, His-46 to Arg-51, Ser-58 to Asp-85.	S0346: 1, L0352: 1 and L0366: 1.		
HARAB47	720654	95	18 - 179	3419			T0082: 1, H0009: 1, L0521: 1 and L0361: 1.		
HARAB58	735212	96	168 - 362	3420		Lys-52 to Ser-57.	S6026: 1 and T0082: 1.		
HARAB68	713402	97	1 - 279	3421			S0222: 1, T0082: 1 and H0009: 1.		
HARAD15	507364	98	54 - 269	3422		Leu-19 to Gly-29, Val-32 to Ser-39.	T0082: 2		
HARAK82	530541	99	2 - 133	3423		Ala-1 to Ala-12, Arg-16 to Thr-23, Arg-36 to Ser-44.	T0082: 2		
HARAR61	578124	100	61 - 276	3424		Lys-11 to Met-16, His-28 to Arg-33, Ala-65 to Asn-72.	T0082: 1 and S0010: 1.		
HARAZ05	564000	101	3 - 305	3425		Phe-8 to Phe-15.	AR061: 5, AR089: 3 H0438: 1 and T0082: 1.	11q13	102200, 106100, 131100, 131100, 131100, 133780, 147050, 153700, 161015, 164009, 168461, 168461, 168461,

HAVMB02	918947	102	13 - 243	3426	Arg-1 to Ala-11, Ala-19 to Asp-29, Gly-67 to Gly-73.	L0439: 2, S0412: 2 and L0438: 1.	180721, 180840, 191181, 193235, 209901, 232600, 259700, 259770, 600045, 600319, 600528, 601884
HAVMC28	685882	103	323 - 487	3427	Ser-4 to Leu-12, Met-14 to Ser-23.	S0412: 2 and L0684: 1.	
HAVMC39	721191	104	83 - 271	3428	Ile-16 to Lys-23.	S0412: 3	
HAVMD02	967936	105	1 - 51	3429		S0412: 4	
HAVMD50	723893	106	67 - 291	3430		S0412: 2	
HAVMF87	731275	107	248 - 448	3431	Pro-8 to Arg-18.	S0007: 3, L0766: 3, S0388: 1, L0794: 1, L0803: 1, L0809: 1 and S0412: 1.	
HAVMM56	974009	108	311 - 535	3432	Pro-9 to Arg-19, His-29 to Asn-44.	S0412: 3	
HAVMM66	922771	109	89 - 265	3433	Arg-1 to Thr-6, Asn-19 to Thr-25.	S0412: 2	
HAVMN25	914798	110	1124 - 801	3434		S0412: 3, L0803: 2,	

HAVMN29	975160	111	379 - 555	3435	Ser-48 to Ile-57.	L0005: 1, S0049: 1, L0659: 1, L0777: 1 and L0731: 1.		
HAVMN51	850763	112	74 - 232	3436	Asp-2 to Gly-8, Gly-14 to Ser-19, Arg-47 to Asn-53.	S0412: 20 and S0378: 1.		
HAVMN76	963088	113	3 - 398	3437	Asp-36 to Glu-42, Ser-44 to Val-53, Glu-65 to Ser-77, Asp-106 to Val-118.	S0412: 3 and L0740: 1.		
HAVMR55	964692	114	344 - 523	3438		L0439: 3, S0412: 3, L0770: 1, L0768: 1, L0794: 1 and L0779: 1.		
HAVMR67	880563	115	102 - 296	3439	Val-45 to Lys-51.	S0412: 17		
HAVMR81	848517	116	58 - 240	3440	Glu-19 to Thr-30.	S0412: 11		
HAVMV03	958075	117	205 - 426	3441	Gln-30 to Arg-38, Leu-56 to Lys-67.	S0412: 2		
HAVMW03	922717	118	283 - 465	3442	Ala-1 to Trp-6.	S0412: 5		
HAVMZ79	926449	119	3 - 209	3443	Arg-22 to Phe-31, Arg-45 to Asn-50, Leu-58 to Ile-64.	S0412: 2 and L0599: 1, 17		
HAVNB60	878508	120	13 - 219	3444	Arg-1 to Gly-6.	L0439: 6, S0412: 6, S6024: 1, S0222: 1 and L0665: 1.		
HAVNB72	914645	121	13 - 315	3445	Arg-1 to Pro-13, Lys-23 to Glu-28, His-52 to Ser-57, Val-64 to Ser-73.	S0412: 6		
						S0412: 3	3p21.1	150250, 164500, 168468, 182280, 238310, 600163,

												601226, 601916
HAVNG11	914764	122	90 - 236	3446					S0412: 2			
HAVNG45	926389	123	197 - 355	3447	Asp-44 to Arg-50.				L0740: 3, L0439: 2, S0412: 2, L0600: 2, L0109: 1, L0065: 1, L0774: 1, L0776: 1, L0659: 1, L0664: 1, L0438: 1, L0779: 1 and L0777: 1.			
HAVNL28	851496	124	111 - 269	3448					S0412: 2			
HAVNO67	957877	125	332 - 505	3449					S0412: 4			
HAVNQ05	930829	126	378 - 641	3450	Glu-41 to Thr-46.				S0412: 5			
HAVNQ24	967940	127	225 - 338	3451					S0412: 2 and H0052: 1.			
HAVNT19	926452	128	3 - 188	3452					S0412: 2			
HAVNX80	927238	129	1265 - 1011	3453	Leu-25 to Asn-33, Glu-56 to Glu-63, Leu-72 to Glu-78.				S0412: 43, L0439: 4, S0414: 2, L0438: 2, S0378: 2, H0406: 1, S0222: 1, H0575: 1, S0051: 1, L0744: 1, L0747: 1, L0777: 1 and S0456: 1.			
HAVNY23	918172	130	447 - 611	3454	Phe-13 to Asp-20, Arg-25 to Met-32.				S0412: 8, L0438: 1 and L0439: 1.			
HAVNZ12	969505	131	13 - 114	3455	Arg-1 to Gly-6.				S0412: 5			
HAVOA03	917911	132	184 - 2	3456					S0412: 4			
HAVOA06	933968	133	410 - 736	3457					S0412: 6, S0414: 4, L0439: 2, S0300: 1.			

HAVOA07	952086	134	3 - 134	3458	Glu-10 to Arg-15, Leu-22 to Arg-27.	S0010: 1, H0051: 1, L0769: 1, L0666: 1 and L0756: 1. S0412: 5		
HAVOA91	957845	135	3 - 224	3459		S0412: 2		
HAVOD03	952052	136	47 - 199	3460		S0412: 2		
HAVOG89	924004	137	2 - 226	3461	Ser-10 to His-21.	S0412: 13		
HAVOK56	902305	138	1 - 189	3462	Leu-28 to Gly-40.	S0412: 2		
HAVOK66	914881	139	34 - 333	3463		S0412: 2		
HAVOL37	848471	140	124 - 342	3464		S0412: 2, S0414: 1 and L0748: 1.		
HAVOS38	922682	141	166 - 399	3465	Pro-26 to Arg-34, His-44 to Ser-54.	S0412: 3, L0743: 1 and L0744: 1.		
HAVOS85	926415	142	3 - 182	3466	Asn-1 to Gly-7.	S0412: 2		
HAVOT53	919368	143	97 - 219	3467	His-6 to Phe-17.	L0745: 2, L0448: 1, S6026: 1, L0756: 1 and S0412: 1.		
HAVOU04	926412	144	1 - 171	3468	Pro-1 to Gln-9, Ser-16 to Arg-22.	S0412: 11, H0351: 1 and H0009: 1.		
HAVOU34	848463	145	39 - 233	3469	His-1 to Thr-6.	S0412: 2		
HAVOW80	965124	146	344 - 505	3470	Arg-32 to Thr-43, Arg-48 to Arg-54.	S0412: 10		
HAVOX65	975320	147	398 - 601	3471	Thr-12 to Lys-18, Arg-52 to Ser-59.	S0412: 27		
HAVPB31	958136	148	149 - 298	3472		S0412: 2		
HAVPB55	893691	149	364 - 513	3473	Pro-26 to Lys-34.	S0412: 2 and L0742: 1.		
HAVTA22	746092	150	2 - 109	3474	Gln-11 to Thr-19.	S0414: 3		

HAVTA48	726079	151	13 - 150	3475	Arg-1 to Gly-6, Lys-29 to Ser-35.	S0414: 3		
HAVTC92	726165	152	399 - 533	3476		S0414: 7		
HAVTD81	966142	153	272 - 424	3477		S0414: 3		
HAVTE18	918221	154	62 - 235	3478		S0414: 6, L0439: 2, L0438: 1 and S0412: 1.		
HAVTE73	914403	155	357 - 485	3479	Thr-5 to Val-11.	S0414: 7		
HAVTF02	918901	156	629 - 805	3480		S0414: 19, L0638: 2, L0776: 2, L0625: 1, L0659: 1 and L0756: 1.		
HAVTF22	965784	157	192 - 1	3481	Arg-1 to Gly-8, Ile-22 to Lys-28, Leu-53 to Phe-63.	S0414: 2 and L0746: 1.		
HAVTG14	878591	158	146 - 316	3482		S0414: 2		
HAVTH93	965771	159	1 - 108	3483		S0414: 2		
HAVTJ80	924083	160	3 - 221	3484		S0414: 10		
HAVTN04	926890	161	3 - 164	3485		S0414: 2		
HAVTN45	946507	162	154 - 381	3486	Arg-9 to Gln-19, Arg-30 to Phe-35, Pro-53 to Ser-68.	S0414: 9		
HAVTN64	958917	163	218 - 394	3487	Leu-36 to Asn-48.	S0414: 3	1p35	118210, 120550, 120570, 120575, 121800, 130500, 133200, 138140,

									138971, 171760, 171760, 172411, 185470, 230350, 255800, 602771
HAVTR02	918210	164	408 - 572	3488	Pro-20 to Glu-27.		S0414: 5		
HAVTR34	965633	165	104 - 250	3489	Gly-12 to Lys-23, Glu-34 to Leu-43.		S0414: 2	10	
HAVTS55	931215	166	2 - 265	3490	Ala-3 to Gly-9, Glu-32 to Ile-40, Thr-77 to Gln-82.		S0414: 4		
HAVTT04	926481	167	341 - 622	3491	Ser-28 to His-35, Arg-73 to Trp-79.		S0414: 56		
HAVTU03	936299	168	1 - 216	3492			S0414: 4		
HAVUD11	965758	169	56 - 256	3493			S0414: 4		
HAVUI28	930884	170	603 - 463	3494			S0414: 11 and S0114: 1.		
HAVUK83	965769	171	182 - 460	3495	Ser-43 to Tyr-48, Thr-73 to Asp-79.		S0414: 4 and L0592: 1.		
HAVUL27	848447	172	209 - 436	3496	Gln-3 to Thr-9, Ser-22 to Thr-32, Thr-39 to Met-47, Pro-49 to Trp-54, Arg-56 to Lys-69.		S0414: 3		
HAVUQ20	966077	173	2 - 184	3497			S0414: 9		

HAVUQ71	966824	174	3 - 149	3498	Ala-13 to Ser-21, Phe-44 to Leu-49.	S0414: 7		
HAVUR03	922684	175	373 - 543	3499		S0414: 6		
HAVUR44	935998	176	396 - 121	3500	Asn-11 to Asn-19, Tyr-27 to Ser-33, Lys-56 to Asn-68.	S0414: 2, L0021: 1, H0052: 1 and L0745: 1.		
HAVUR50	928287	177	42 - 383	3501	Tyr-35 to Gly-43, Ser-89 to Leu-98.	S0414: 3		
HAVUT92	922455	178	495 - 373	3502		S0414: 6		
HAVUV10	940091	179	154 - 381	3503	Arg-9 to Gln-19, Arg-30 to Phe-35, Pro-53 to Ser-68.	S0414: 6		
HAVUX44	918137	180	228 - 422	3504		S0414: 3		
HAVVA69	975161	181	589 - 825	3505	Asn-26 to Asn-31.	S0414: 25, L0756: 2, S0222: 1, L0796: 1 and S0412: 1.		
HAVVB22	847291	182	398 - 601	3506	Lys-4 to Lys-22.	S0414: 2		
HAVVF59	864419	183	62 - 295	3507	Thr-1 to Asn-11.	S0414: 6		
HAVVH11	960201	184	3 - 206	3508		S0414: 20		
HAVVH15	919569	185	2 - 187	3509	Ser-9 to Arg-14, Ala-32 to Pro-39, Ser-56 to Glu-62.	S0414: 3		
HAVVH65	852908	186	350 - 484	3510	Phe-1 to Thr-6.	S0414: 3		
HAVVO77	952748	187	165 - 341	3511	Arg-1 to Met-11, Ser-31 to Trp-39, Lys-46 to Pro-59.	S0414: 13	11q12-q13	102200, 106100, 131100, 131100, 131100,

HAVVQ38	864421	188	283 - 423	3512	S0414: 10	4q13-q21	133780, 147050, 153700, 161015, 164009, 168461, 168461, 168461, 180721, 180840, 191181, 193235, 209901, 232600, 259700, 259770, 600045, 600319, 600528, 601884
							103600, 103600, 103600, 104150, 104150, 104500, 125490, 147790, 170650,

										173910, 252500, 252500
HAVVR10	963072	189		1 - 126	3513	Ser-7 to Tyr-14, Pro-19 to Gly-24.			S0414: 2	
HAVVS63	957771	190		75 - 341	3514	Arg-25 to Thr-33, Thr-60 to Arg-89.			S0414: 34	
HAVVU45	973499	191		91 - 201	3515	Gly-20 to Gly-29.			S0414: 4	
HAVVV49	930875	192		1050 - 1235	3516	Met-5 to Gln-10, Thr-45 to Leu-62.			S0414: 12	
HAVVY03	963065	193		622 - 380	3517	Gln-21 to Cys-26, Ser-70 to Trp-75.			S0414: 4	
HAVVY15	975308	194		255 - 434	3518	Thr-12 to Ser-19.			S0414: 5	
HAVVZ93	948617	195		3 - 143	3519				S0414: 3	
HAXHB11	524232	196		221 - 3	3520				T0126: 2	
HBBBD96	717856	197		1 - 102	3521	Pro-14 to Gln-19.			H0374: 1 and H0052: 1.	
HBBBBF45	753160	198		2 - 175	3522				H0374: 2	
HBBMA89	787032	199		5 - 241	3523	Lys-1 to Thr-13.			S0282: 1 and H0389: 1.	
HBHAB88	529943	200		1 - 117	3524				S0029: 2	
HBHAC17	665023	201		117 - 479	3525	Asn-27 to Phe-39.			S0029: 2, S0282: 1 and S0260: 1.	
HBHAD67	530087	202		124 - 264	3526	Leu-12 to Ser-21, Cys-29 to Thr-36.			S0029: 2	
HBHAD71	530088	203		208 - 300	3527				S0029: 2	
HBHAE14	973759	204		269 - 436	3528	Asp-1 to Gly-6, Val-31 to Glu-40.			S0029: 3	
HBHAE65	530085	205		47 - 190	3529	Gln-1 to Tyr-13.			S0029: 2	

HBHAF50	530028	206	10 - 159	3530			S0029: 2		
HBHAG21	530082	207	62 - 163	3531	Arg-1 to Ser-7.		L0805: 3, S0029: 2, L0764: 1 and L0766: 1.		
HBHAG56	733709	208	43 - 198	3532	Cys-22 to Asp-34.		S0029: 2		
HBIAE07	954121	209	3 - 371	3533	Arg-10 to Ser-15.		S0049: 1, H0052: 1, L0742: 1 and L0731: 1.		
HBIAE50	572444	210	1 - 168	3534	Pro-8 to Thr-16, His-19 to Ser-27.		S0049: 2		
HBIAE83	529103	211	70 - 180	3535	Glu-10 to Gly-17.		S0049: 2, L0747: 1 and L0599: 1.		
HBIAF60	529098	212	1 - 213	3536	Arg-7 to Glu-17.		S0049: 2		
HBIAH61	742110	213	156 - 326	3537	Gly-30 to Phe-39, Gln-47 to Arg-56.		S6026: 1, S0049: 1 and L0756: 1.		
HBIAI29	529154	214	3 - 188	3538			S0049: 2		
HBIAI40	525881	215	25 - 156	3539			S0010: 1 and S0049: 1.		
HBIAJ39	575306	216	3 - 131	3540	Arg-11 to Ile-17, Thr-31 to Arg-36.		T0010: 4, L0415: 2, S0049: 2, L0351: 2, L0805: 2, S6026: 1, H0618: 1, S0010: 1 and H0052: 1.		
HBIK17	848067	217	228 - 365	3541	Cys-1 to His-8.		S0049: 2		
HBIK19	572416	218	2 - 202	3542	Pro-58 to Lys-63.		S0049: 2 and L0803: 1.		
HBIK70	848061	219	42 - 230	3543	Gly-16 to Tyr-23.		S0049: 2		
HBIAN10	968383	220	57 - 281	3544			S0049: 2		
HBIAN45	967677	221	3 - 77	3545	His-1 to Phe-13, Gly-19 to Lys-25.		S0049: 2		
HBIAO95	530309	222	66 - 245	3546	Gly-12 to Gly-17.		S0001: 1, S0049: 1 and L0439: 1.		

HBIAV51	429335	223	225 - 28	3547			H0438: 1 and S0049: 1.	
HBIAZ52	853026	224	1 - 186	3548			S0049: 1 and H0052: 1.	
HBIBD67	698874	225	167 - 376	3549		Gly-46 to Ala-52.	L0794: 4, S0300: 1, S0222: 1, S0049: 1 and L0438: 1.	
HBIBE32	668820	226	2 - 166	3550			S0049: 2	
HBIBK27	528057	227	3 - 206	3551		Ser-6 to Gly-12.	S0038: 2 and S0049: 1.	
HBIBS89	960979	228	1 - 291	3552		Arg-2 to Gln-10, Thr-26 to Arg-39.	L0439: 6, L0438: 4, H0052: 2, H0009: 2, S0007: 1, S0222: 1, H0438: 1, S0049: 1, H0051: 1 and L0742: 1.	
HBIBT57	854572	229	190 - 633	3553		Pro-10 to Pro-15, Trp-58 to Gln-75, Arg-105 to His-111.	H0052: 6, S0049: 2, H0123: 1, S0051: 1, L0769: 1, L0776: 1 and L0439: 1.	
HBIBV08	848037	230	136 - 384	3554		Thr-8 to Ile-19, Pro-59 to Glu-67, Pro-78 to Gly-83.	S0049: 2	
HBICA34	848038	231	57 - 245	3555			S0049: 1 and S0031: 1.	
HBICH13	916943	232	1 - 219	3556			S0049: 2	
HBICH16	848028	233	1 - 318	3557		Gly-1 to Ser-6, Thr-44 to Arg-50, Phe-74 to Glu-82.	S0049: 2	
HBICH18	935833	234	3 - 137	3558		His-1 to Glu-13.	S0049: 2	
HBICH28	711319	235	130 - 351	3559			S0049: 2	
HBICB31	573872	236	200 - 430	3560			H0052: 2 and S0049: 1.	
HBICP57	810464	237	1 - 228	3561		Lys-1 to Gly-6.	AR089: 7, AR061: 7	22q

									S0049: 1, H0052: 1, L0146: 1 and T0010: 1.		
HBICT25	771414	238	3 - 155	3562					S0007: 4, S0049: 1 and H0052: 1.		
HBICW21	669794	239	60 - 218	3563					S0049: 2		
HBIFA49	578755	240	3 - 134	3564					H0434: 2		
HBIFC58	578759	241	53 - 154	3565					H0434: 2		
HB�AA35	723547	242	55 - 288	3566					H0006: 2		
HBOAA12	857619	243	66 - 383	3567					H0310: 1 and S0388: 1.		
HBOAA46	657370	244	164 - 364	3568					H0310: 1, S0051: 1, L0657: 1 and L0587: 1.		
HBOAB26	666961	245	65 - 235	3569					H0310: 1, H0052: 1, L0438: 1 and L0439: 1.		
HBOAD27	506408	246	1 - 168	3570					L0157: 5, L0805: 2, L0756: 2, L0753: 2, S0412: 2, S0010: 1, H0310: 1, L0779: 1 and L0759: 1.		
HBQAA11	839996	247	364 - 504	3571					H0229: 2		
HBQAA43	522629	248	33 - 263	3572					H0229: 2		
HBQAB59	504319	249	414 - 244	3573					L0439: 5, H0229: 1 and T0010: 1.		
HBQAC59	739625	250	198 - 332	3574					H0229: 2		
HBQAE38	525827	251	201 - 1	3575					L0439: 3 and H0229: 2.		

HBQAE94	847712	252	17 - 154	3576	Ser-57 to Ile-67.			
HBWAG01	921776	253	2 - 82	3577	Lys-5 to Glu-14.		H0229: 2	
HBWAG76	767711	254	462 - 40	3578			S0021: 2	
	769922	3236	3 - 200	6560			AR089: 5, AR061: 2 S0001: 1 and S0021: 1.	
HBWAI30	523314	255	160 - 249	3579			S0021: 2	
HBWAK22	719911	256	3 - 209	3580	Asp-7 to Arg-13.		S0386: 1 and S0021: 1.	
HBWBB27	682565	257	3 - 191	3581	Gly-1 to Pro-9, Ala-19 to Met-26, Ser-54 to Ser-60.		H0052: 1 and S0386: 1.	
HBWBD18	665283	258	3 - 251	3582	Pro-7 to Ser-12, Lys-27 to Lys-37, Ser-46 to Leu-51.		S0386: 2	
HBWBD84	662269	259	101 - 274	3583			S0386: 2	
HBWBE94	773285	260	180 - 323	3584	Gly-27 to Glu-34.		S0386: 2	
HBWBF56	733029	261	160 - 264	3585			S0386: 2	
HBWBF61	741341	262	1 - 213	3586	Cys-57 to Lys-65.		S0386: 2	
HBWBG07	952471	263	3 - 284	3587			S0386: 2	
HBWBG20	669205	264	110 - 307	3588			S0386: 2	
HBWBG32	698710	265	135 - 467	3589	Ile-57 to Lys-65.		S0386: 2	
HBWBH63	956217	266	208 - 537	3590			S0222: 1, S0386: 1 and L0776: 1.	
HBWBI83	673938	267	229 - 405	3591			S0386: 2	
HBWBI90	863620	268	212 - 391	3592	Thr-30 to Trp-35, Gly-49 to Gly-55.		S0386: 2	
HBWBJ85	765191	269	239 - 388	3593			S0386: 2	
HBWBK16	661400	270	293 - 451	3594			S0386: 2	

HBWBK17	828053	271	3 - 290	3595	Pro-28 to Pro-43, Thr-48 to Arg-53.	S0386: 2	
HBWBK22	673941	272	171 - 398	3596	Gln-14 to Asp-19.	S0386: 2	
HBWBK24	676765	273	493 - 218	3597		S0386: 2	
HBWBK28	685985	274	40 - 180	3598		S0386: 2	
HBWBK37	706077	275	174 - 308	3599		S0386: 2	
HBWBK38	706092	276	154 - 336	3600	Leu-5 to Gln-19.	S0386: 2	
HBWBK46	718697	277	73 - 240	3601	His-22 to Arg-28.	S0386: 3	
HBWBK48	721282	278	82 - 195	3602		S0386: 2	
HBWBK49	722348	279	3 - 167	3603	Lys-6 to Arg-16, Ser-46 to Arg-55.	S0386: 2	
HBWBK51	670192	280	236 - 403	3604		S0386: 2	
HBWBK53	863584	281	1 - 195	3605		S0386: 2	
HBWBK54	729178	282	115 - 291	3606	Lys-7 to Arg-22.	S0386: 2	
HBWBK61	741312	283	103 - 261	3607		S0386: 2	
HBWBK63	744643	284	162 - 332	3608		S0386: 2	
HBWBK67	751263	285	3 - 134	3609		S0386: 2	
HBWBK68	752702	286	55 - 204	3610		S0386: 2	
HBWBK69	754731	287	215 - 352	3611		S0386: 2	
HBWBK71	760031	288	81 - 260	3612	Gly-46 to Trp-51.	S0386: 2	
HBWBK72	863625	289	301 - 525	3613		S0386: 2, H0052: 1 and L0758: 1.	
HBWBK74	765192	290	1 - 225	3614	Ser-41 to Trp-48.	S0386: 2	
HBWBK76	767759	291	70 - 210	3615	Ser-35 to Asn-40.	S0386: 2	
HBWBK79	774615	292	79 - 204	3616	Asp-37 to Ser-42.	S0386: 2	
HBWBK82	779503	293	1 - 135	3617	Gln-16 to Thr-29.	S0386: 2	
HBWBK85	784063	294	230 - 373	3618		S0386: 2	
HBWBK90	788608	295	62 - 286	3619	Arg-16 to Trp-22,	S0386: 2	

HBWBK91	789548	296	171 - 356	3620	Ser-37 to Glu-43.	S0386: 2	
HBWBK94	793309	297	93 - 293	3621	Tyr-30 to Arg-35, Met-51 to Lys-59.	S0386: 2	
HBWBL06	933269	298	103 - 330	3622	Lys-16 to His-21, Lys-31 to Lys-45, Arg-49 to Ile-54, Thr-59 to Ala-76.	S0386: 2	
HBWBL16	661391	299	3 - 134	3623	Val-13 to Gln-18.	S0386: 2	
HBWBL19	668092	300	119 - 244	3624	Val-35 to Asn-40.	S0386: 2	
HBWBL21	847692	301	163 - 384	3625		S0386: 2	
HBWBL22	673931	302	99 - 236	3626		S0386: 2	
HBWBL25	677625	303	2 - 220	3627	Thr-42 to Leu-51.	S0386: 2	
HBWBL27	682494	304	217 - 441	3628		S0386: 2	
HBWBL28	847693	305	190 - 333	3629		S0386: 2	
HBWBL30	691530	306	262 - 429	3630	Thr-1 to Asn-6.	S0386: 2	
HBWBL32	698703	307	2 - 160	3631	Arg-21 to Asp-28.	S0386: 2	
HBWBL40	863622	308	2 - 346	3632	Gly-36 to Ser-41, Asn-65 to Gln-78.	S0386: 2	
HBWBL46	718717	309	257 - 457	3633		S0386: 2	
HBWBL48	721281	310	243 - 365	3634	Gly-31 to Lys-36.	S0386: 3 and L0745: 1.	
HBWBL51	863615	311	3 - 278	3635	His-46 to Thr-55.	S0386: 2	
HBWBL54	729185	312	205 - 381	3636	Gln-1 to Leu-7, Thr-45 to Arg-50.	S0386: 2	
HBWBL59	738929	313	212 - 316	3637		S0386: 2	
HBWBL64	746166	314	11 - 145	3638	Lys-28 to Phe-33.	S0386: 2	
HBWBL68	752376	315	26 - 178	3639	Arg-13 to Leu-35, Ser-45 to His-50.	S0386: 2	

HBWBL69	754725	316	194 - 343	3640	Lys-1 to Tyr-19, Glu-30 to Tyr-39.	S0386: 2	
HBWBL72	937572	317	132 - 299	3641	Glu-32 to Ser-37, Thr-42 to Asp-47.	S0386: 2	
HBWBL73	764126	318	1 - 195	3642		S0386: 2	
	974465	3237	32 - 187	6561			
HBWBL89	786638	319	147 - 437	3643	Thr-10 to Gln-17, Gly-21 to Asp-35.	S0386: 2	
HBWBL94	863583	320	263 - 439	3644		S0386: 2	
HBWBM35	706079	321	2 - 229	3645	Tyr-55 to Arg-62.	S0386: 2	
HBWBM72	760847	322	35 - 223	3646		S0386: 2	
HBWBN22	673996	323	156 - 308	3647		S0386: 2	
HBWBN24	676794	324	2 - 115	3648		S0386: 2	
HBWBN38	706082	325	60 - 371	3649	Lys-1 to Ser-6, Arg-31 to Arg-39.	S0386: 2	
HBWBO54	729197	326	146 - 274	3650	Lys-16 to Phe-24.	S0386: 2	
HBWBO96	771776	327	257 - 478	3651		S0386: 2	
HBWBP02	919081	328	3 - 128	3652		S0386: 2	
HBWBQ34	703713	329	45 - 206	3653	Asp-13 to Asp-21.	S0386: 2 and S0021: 1.	
HBWBQ94	793951	330	71 - 187	3654	Pro-4 to Asn-15.	S0049: 1 and S0386: 1.	
HBWBR04	927328	331	84 - 308	3655		S0386: 2	
HBWBR10	963820	332	134 - 304	3656	Asp-15 to Arg-21.	S0386: 2 and L0769: 1.	
HBWBR27	682568	333	112 - 183	3657		S0386: 2	
HBWBS17	662319	334	132 - 395	3658	Pro-34 to Asp-41.	H0052: 1, L0738: 1, S0386: 1, L0803: 1 and L0805: 1.	
HBWBS34	656384	335	3 - 251	3659		S0386: 2	
HBWBS38	706083	336	3 - 221	3660	Ser-7 to Ser-12,	S0386: 2	

HBWBS41	712023	337	70 - 240	3661	Lys-26 to Asp-33.			
HBWBT31	668151	338	81 - 440	3662	Ile-11 to Thr-19.	S0386: 2		
HBWBT35	690259	339	73 - 309	3663	Leu-8 to His-15.	S0386: 2		
HBWBU50	723981	340	256 - 549	3664	Ser-20 to Gly-42.	S0386: 3		
					Leu-7 to Glu-12.	L0439: 3, L0005: 1, L0157: 1, T0010: 1, S0386: 1, L0742: 1 and L0608: 1.		
HBWBV25	677601	341	2 - 247	3665	Met-36 to His-41.	S0386: 2		
HBWBV72	863628	342	82 - 342	3666	Arg-3 to Gln-12.	S0386: 2 and S0021: 1.		
HBWBW16	661438	343	199 - 324	3667	Thr-17 to Leu-22.	S0386: 2		
HBWBW63	744664	344	109 - 231	3668		S0386: 2		
HBWBW85	690254	345	26 - 136	3669	Gln-17 to Glu-23.	S0386: 2		
HBWBW96	750229	346	200 - 445	3670		H0392: 1 and S0386: 1.		
HBWBX83	780871	347	260 - 388	3671		S0386: 2		
HBWCB21	670390	348	110 - 235	3672		S0386: 2		
HBWCD21	670361	349	3 - 176	3673	Gln-31 to Val-36, Arg-47 to Phe-52.	S0386: 2		
HBWCD74	974464	350	2 - 301	3674	Lys-1 to Cys-8.	S0386: 3		
HBWCF26	934746	351	183 - 386	3675		S0386: 2		
HBWCF27	682385	352	234 - 485	3676		L0766: 4, L0744: 2, L0779: 2, S6024: 1, S0386: 1, L0803: 1, L0804: 1, L0776: 1, L0789: 1, L0745: 1 and L0780: 1.		
HBWCF55	731327	353	200 - 346	3677		H0201: 1 and S0386: 1.		
HBWCJ64	746233	354	57 - 239	3678		S0386: 2		

HBWCK36	706093	355	66 - 206	3679			S0386: 2		
HBWCK84	782799	356	128 - 295	3680	Lys-38 to Leu-47.		S0386: 2		
HBWCL70	813284	357	284 - 484	3681	Ser-21 to Asn-28.		S0386: 2		
HBWCM27	682566	358	3 - 260	3682	Asp-1 to Asp-6, Ser-14 to Asn-24, Gly-50 to Gly-62, Met-67 to His-76.		H0052: 1 and S0386: 1.		
HBWCN37	706094	359	41 - 196	3683	Glu-1 to Met-10.		S0386: 2		
HBWCO44	701936	360	222 - 308	3684			S0386: 2		
HBWCO63	744645	361	101 - 226	3685	Ser-26 to Gly-31.		S0386: 1 and S0021: 1.		
HBWCO83	925673	362	81 - 329	3686	Pro-35 to Gly-43, Arg-71 to Lys-77.		S0386: 2		
HBWCP02	919067	363	287 - 478	3687			S0386: 2		
HBWCR07	952501	364	146 - 331	3688	Tyr-1 to Thr-13, Ile-20 to Gln-29.		H0123: 1 and S0386: 1.		
HBWCR10	963815	365	2 - 205	3689	Gly-36 to Ala-48.		S0386: 2		
HBXAC85	953621	366	86 - 271	3690	Pro-5 to Gly-13, Leu-17 to Lys-23, Cys-38 to Lys-54.		S0038: 2		
HBXAG07	953726	367	35 - 226	3691	Ser-36 to Thr-41.		S0038: 2		
HBXAN27	823467	368	12 - 395	3692			AR061: 0, AR089: 0 S0038: 2		
HBXAR75	766477	369	2 - 241	3693			S0036: 1 and S0038: 1.		
HBXAS32	872987	370	101 - 1321	3694			AR061: 1, AR089: 1 L0742: 3, L0769: 2, S6024: 1, S0222: 1, H0438: 1, S0010: 1, H0052: 1, T0010: 1,		

HBXAU37	529096	371	1 - 102	3695		Trp-1 to Arg-6, Ser-17 to Ser-24.	S0038: 1, L0768: 1, L0794: 1 and L0790: 1. S0038: 2		
HBXAW13	921630	372	31 - 150	3696			S0038: 2		
HBXAX95	836012	373	13 - 336	3697		Gln-14 to Trp-19.	S0038: 2		
HBXBB52	592303	374	2 - 151	3698			S0038: 2		
HBXBD70	528054	375	3 - 182	3699		Ser-2 to Ser-9.	S0038: 2		
HBXBG07	924768	376	1 - 138	3700			H0052: 1 and S0038: 1.		
HBXBL66	924733	377	73 - 303	3701		Pro-37 to Asn-43, Asn-53 to Leu-58.	AR089: 1, AR061: 1 S0222: 1 and S0038: 1.		
HBXBM21	960381	378	95 - 274	3702			S0007: 1, H0009: 1 and S0038: 1.		
HBXBU17	417004	379	2 - 274	3703		Gly-4 to Pro-18.	S0038: 2		
HBXBU74	529092	380	2 - 268	3704			S0038: 2		
HBXBW64	528050	381	1 - 186	3705			S0038: 2		
HBXBW83	528049	382	40 - 183	3706			S0038: 2		
HBXCC49	961004	383	1 - 315	3707		Arg-11 to Thr-18, Ala-29 to Gln-36, Cys-96 to Tyr-105.	H0052: 1 and S0038: 1.		
HBXCD25	506625	384	3 - 203	3708		Ser-4 to Lys-13, Ser-50 to Gly-56.	S0038: 2		
HBXCD39	974487	385	187 - 399	3709		Gly-8 to His-22, Ser-30 to Gly-39.	S0038: 4		
HBXCE04	924736	386	236 - 478	3710		Glu-14 to Gln-24, Asp-33 to Asp-40.	S0038: 2 and H0051: 1.		
HBXCE80	573476	387	141 - 323	3711		His-26 to Asp-37.	S0038: 2		
HBXCE86	702579	388	1 - 369	3712		Pro-11 to Gly-16.	L0754: 3, S0038: 2 and		

HBXCF74	575003	389	3 - 140	3713	Ser-25 to Gly-31.	S0049: 1.		
HBXCI59	676013	390	227 - 382	3714	Ser-7 to Asn-13.	H0052: 1 and S0038: 1.		
HBXCL13	847666	391	392 - 622	3715		S0010: 1 and S0038: 1.		
HBXCM26	911281	392	2 - 853	3716		L0439: 3, H0052: 1, H0194: 1 and S0038: 1.	10q25.1	167409
HBXCM74	847671	393	123 - 200	3717		L0366: 2, S0222: 1, H0052: 1, H0051: 1 and S0038: 1.		
HBXCO60	573417	394	193 - 348	3718	Gly-17 to Gly-34, Ala-43 to Cys-51.	S0038: 2		
HBXCQ47	573431	395	51 - 167	3719		S0038: 2		
HBXCQ62	573446	396	152 - 48	3720	Pro-1 to Pro-7, Pro-30 to Lys-35.	S0038: 2		
HBXCQ66	760850	397	1 - 246	3721	Thr-2 to Ala-25.	S0038: 2		
HBXCR10	968092	398	220 - 369	3722		S0038: 2		
HBXCX26	506302	399	134 - 406	3723	Asn-25 to Leu-40, Lys-56 to Cys-64.	S0038: 2		
HBXCX63	745171	400	25 - 210	3724		S0038: 2		
HBXCX82	863538	401	64 - 183	3725	Asn-1 to Thr-11.	S0038: 2		
HBXCZ05	941885	402	14 - 208	3726		S0038: 2		
HBXDK02	920457	403	2 - 235	3727	Arg-7 to Arg-13, Phe-33 to Leu-41, Lys-43 to Asp-52, Pro-73 to Tyr-78.	S0038: 2		
HBXDK54	429104	404	1 - 252	3728		H0052: 1, S0038: 1 and 1p L0747: 1.		
HBXDK67	715765	405	3 - 323	3729		H0052: 1 and S0038: 1.		

HBXDN70	757307	406	175 - 441	3730	Gln-1 to Glu-8, Pro-35 to Thr-40.	S6028: 1 and S0038: 1.		
HBXDO77	578811	407	115 - 282	3731		S0038: 2 and L0592: 1.		
HBXEB92	863514	408	106 - 300	3732	Ser-8 to Ala-18.	H0438: 2		
HBXED53	578730	409	107 - 265	3733		H0438: 2		
HBXFD37	910013	410	9 - 581	3734	Met-40 to His-48, Lys-56 to Ser-67, Glu-93 to Asn-98, Tyr-121 to Met-126, Ser-133 to Cys-138, Gln-164 to Ile-169, Glu-182 to Lys-191.	AR089: 15, AR061: -8 2 L0794: 7, S0010: 3, H0052: 2, S0222: 1, H0438: 1, S0665: 1, S0036: 1, S0038: 1, L0594: 1 and L0096: 1.		
HBXFD86	489162	411	42 - 209	3735	Arg-1 to Glu-7.	H0438: 1 and S6028: 1.		
HBXFE70	974480	412	32 - 169	3736	Lys-32 to Cys-38.	H0438: 3		
HBXFF11	967263	413	23 - 283	3737	Ser-14 to Ile-20.	H0438: 1 and S0346: 1.		
HBXFF19	705817	414	58 - 213	3738		H0438: 1 and S0346: 1.		
HBXFG22	576405	415	175 - 342	3739	Phe-25 to Trp-34.	H0438: 2		
HBXFI48	720935	416	3 - 296	3740	Gln-12 to Leu-21.	H0438: 2		
HBXFI73	960261	417	279 - 416	3741	Asp-1 to Ser-6.	H0438: 1 and H0051: 1.		
HBXFL92	576356	418	110 - 259	3742	Thr-27 to Lys-33.	H0438: 2		
HBXFR18	576597	419	3 - 356	3743	Glu-6 to Val-15, Arg-37 to Gly-45, Arg-59 to Gly-65, Pro-73 to Ser-82.	H0438: 2		
HBXFFV15	718798	420	3 - 176	3744	Phe-4 to Thr-9, Cys-41 to Trp-46.	S0300: 1 and H0438: 1.		
HBXFFV73	578763	421	2 - 187	3745		H0438: 1 and H0434:		

HBXFW05	881672	422	3 - 476	3746	Met-7 to Asp-18, Asp-23 to Thr-54.	1. S6016: 1, H0438: 1, S0049: 1 and L0438: 1.		
HBXFW74	837641	423	60 - 386	3747		S6016: 1 and H0438: 1.7q33-q36	142335, 152427, 163729, 176450, 180105, 190605, 222800, 600510, 600725	
HBXFX08	959631	424	279 - 515	3748	Ser-27 to Gly-34.	H0438: 1 and T0010: 1.		
HBXFY05	920354	425	49 - 204	3749		H0438: 2		
HBXFY26	576090	426	3 - 230	3750	Gln-12 to Asn-22, Gly-60 to Gly-73.	H0438: 2		
HBXFY41	576095	427	68 - 358	3751	Pro-14 to Gly-28.	H0438: 2 and L0783: 2.		
HBXFY62	576091	428	63 - 242	3752	Pro-2 to Asp-9.	AR050: 26, AR051: 21, AR054: 6 H0438: 2 and L0596: 1.		
HBXFY78	576347	429	27 - 137	3753		H0438: 2		
HBXFZ66	576690	430	111 - 305	3754	Gly-25 to Glu-31, Ser-44 to Lys-49, Pro-60 to Gly-65.	H0438: 1 and S0049: 1.		
HBXGA50	863493	431	56 - 445	3755	Val-1 to Ala-8, Arg-47 to Thr-60,	H0052: 4, L0742: 4, L0769: 3, H0009: 2,		

						Gly-62 to Asn-71.	L0439: 2, L0756: 2, H0438: 1, S0049: 1, S0388: 1, L0805: 1, L0787: 1, S0428: 1 and L0741: 1.			
HBXGB08	959632	432	69 - 509	3756		Pro-7 to Thr-16, Ser-37 to Arg-48, Arg-53 to Cys-61, Ala-79 to Ala-86.	H0438: 1 and S0038: 1.			
HBXGB85	849622	433	162 - 458	3757		Lys-5 to Pro-18, Glu-24 to Ser-36, Pro-57 to Gly-63.	S0222: 1, H0438: 1 and H0052: 1.			
HBXGC42	577815	434	2 - 385	3758			H0438: 1 and H0052: 1.	16pter		
HBXGC47	576661	435	184 - 387	3759		Leu-8 to Tyr-16.	H0438: 1 and S0038: 1.			
HBXGD30	847627	436	3 - 188	3760			H0438: 1 and H0052: 1.			
HBXGI50	506248	437	3 - 314	3761			H0438: 2			
HBXGI64	576071	438	236 - 343	3762			H0438: 2			
HBXGM05	847626	439	3 - 194	3763		Pro-6 to Ser-17.	S0222: 1, H0438: 1, H0052: 1 and L0611: 1.	11q22-qter		
HBXGM79	770258	440	42 - 386	3764		Gly-33 to Ile-56, Asn-82 to Gly-90.	H0261: 1 and H0438: 1.			
HBXGN93	754806	441	513 - 740	3765		Thr-15 to Ala-23.	L0439: 2, H0438: 1 and S0346: 1.			
HBXGO28	577813	442	180 - 437	3766		Ala-2 to Pro-9.	H0261: 1 and H0438: 1.			
HBXGP63	786957	443	86 - 247	3767			H0438: 4			

HBXGQ52	576093	444	1 - 291	3768		AR089: 4, AR061: 2 H0438: 3 and S0260: 1.		
HBXGT57	734866	445	2 - 367	3769	Arg-11 to Ser-20, Gly-24 to Ala-38, Ser-51 to Arg-57.	H0391: 1 and H0438: 1.		
HCE1A22	932305	446	1 - 195	3770	Pro-32 to Pro-38, Leu-43 to Phe-54.	H0052: 2		
HCE1A68	973312	3238	3 - 173	6562	Phe-19 to Ser-27.	H0052: 2		
HCE1D50	847567	447	150 - 1	3771		H0052: 2, S0346: 1 and L0366: 1.		
HCE1D50	740941	448	37 - 372	3772	Arg-12 to Lys-25.	H0052: 2 and L0385: 1.		
HCE1D59	506671	449	104 - 352	3773	Gly-1 to Arg-12, Gly-31 to Gln-39.	H0052: 2		
HCE1F54	863083	450	306 - 455	3774		H0052: 2		
HCE1F68	863034	451	3 - 215	3775	Glu-18 to Arg-30.	H0052: 2		
HCE1F69	667012	452	93 - 605	3776	Pro-34 to Thr-48.	L0750: 2, H0052: 1 and H0172: 1.		
HCE1G47	503225	453	3 - 146	3777	Pro-1 to Asp-18.	H0052: 2		
HCE1J23	573921	454	2 - 112	3778	Leu-11 to Ser-16.	H0052: 2		
HCE1J42	573943	455	2 - 247	3779	Arg-27 to Gly-36.	H0052: 2		
HCE1J54	573924	456	232 - 360	3780		H0052: 2		
HCE1J59	850563	457	1 - 144	3781	Gly-1 to Thr-9.	H0052: 3		
HCE1K11	972371	458	3 - 134	3782		H0052: 3		
HCE1K38	529701	459	2 - 139	3783		H0052: 2		
HCE1L77	526165	460	2 - 145	3784		H0052: 1 and H0194: 1.		
HCE1O80	500975	461	110 - 235	3785	Val-1 to Cys-6.	H0052: 2		
HCE1P77	507213	462	430 - 642	3786	Leu-23 to Phe-30.	S0049: 1 and H0052: 1.		

HCE1R52	726036	463	201 - 398	3787			S0282: 1 and H0052: 1.		
HCE1S69	527462	464	1 - 150	3788	Pro-10 to Leu-17, Trp-43 to Glu-50.		H0052: 2		
HCE1T47	835937	465	12 - 248	3789	Asn-32 to Cys-44, Asn-51 to Asn-58.		H0052: 2		
HCE1W89	693003	466	32 - 235	3790			H0052: 2		
HCE1X05	782781	467	1 - 270	3791			H0261: 1 and H0052: 1.		
HCE1X11	967444	468	263 - 373	3792	His-8 to Gly-21.		H0052: 3 and H0261: 1.		
HCE1Y33	573914	469	2 - 229	3793	Gly-11 to Pro-18, Gly-52 to Gly-57, Val-66 to Pro-73.		H0052: 2		
HCE1Y55	667123	470	679 - 329	3794	Ser-7 to Gly-15, Ser-25 to Pro-32, Leu-48 to Gly-61, Thr-82 to Gln-88, Ser-97 to Asp-103.		S0010: 2, H0052: 1, T0010: 1 and L0594: 1.		
HCE2B42	507401	471	179 - 460	3795	Pro-19 to Cys-27.		H0052: 2		
HCE2B60	853020	472	1 - 192	3796	His-57 to Leu-63.		H0052: 6		
HCE2B62	530837	473	251 - 361	3797	Ser-12 to Gly-17.		H0052: 2		
HCE2B73	577087	474	1 - 417	3798	Arg-10 to Asn-19, Gly-72 to Thr-77.		AR089: 5, AR061: 3 S0010: 1 and H0052: 1.	19p13.3	108725, 120700, 133171, 136836, 145981, 147141, 164953,

									188070, 600957, 601238, 601846, 602216, 602477
HCE2B75	573864	475	1 - 162	3799	His-27 to Gly-35.	H0052: 2			
HCE2C24	526158	476	107 - 256	3800		H0052: 1 and H0194: 1.			
HCE2C47	530526	477	2 - 106	3801	Trp-1 to Ala-11.	H0052: 2			
HCE2J56	571342	478	1 - 435	3802	Glu-31 to Gly-39, Ser-69 to Ser-74.	AR061: 6, AR089: 3 H0052: 2			
HCE2J72	757802	479	175 - 471	3803	Glu-36 to Asp-46.	AR050: 82, AR054: 52, AR051: 50 H0052: 2 and S6014: 1.	11p15.5		125852, 126452, 126452, 141900, 141900, 141900, 141900, 141900, 142000, 142000, 142200, 142250, 142270, 176730, 176730, 176730,

									190020, 191290, 192500, 192500, 194071, 194071, 204500, 600856, 601680, 602631, 602631
HCE2J73	573973	480	95 - 274	3804				H0052: 2	
HCE2K01	943915	481	1 - 771	3805	Gly-1 to Arg-13, Thr-27 to Thr-34, Ala-46 to Glu-61, Pro-69 to Ser-77, Pro-104 to Gly-113, Ser-126 to Val-132, Pro-200 to Leu-209.	AR061: 3, AR089: 1 H0052: 6, L0741: 5, S0222: 3, S0031: 3, S0036: 2, H0261: 1, H0441: 1, S0346: 1, S0049: 1, S0038: 1, H0522: 1, L0742: 1, L0752: 1, S0260: 1 and L0366: 1.	12q13	107777, 123940, 139350, 139350, 148040, 148041, 148043, 148070, 231550, 600194, 600231, 600536, 600808, 600956, 601284, 601769, 601769.	

								601928, 602116, 602153
HCE2M95	795992	482	3 - 167	3806			AR089: 86, AR061: 18 H0052: 1 and S6028: 1.	141750, 141800, 141800, 141800, 141800, 141850, 141850, 141850, 141850, 141850, 156850, 186580, 191092, 600140, 600273, 601313, 601785
HCE2O31	460801	483	674 - 402	3807			H0052: 1 and H0009: 1.	
	853145	3239	184 - 417	6563				
HCE2O32	523155	484	44 - 160	3808		Lys-32 to Phe-38.	H0052: 3	
HCE2P92	753856	485	2 - 247	3809			H0052: 1, T0010: 1 and L0439: 1.	
HCE2R91	821543	486	158 - 340	3810			H0052: 2 and L0741: 1.	17
HCE2T60	573939	487	2 - 151	3811			H0052: 2	

HCE2Y27	530708	488	2 - 289	3812	Asn-77 to Leu-82.	H0052: 2	
HCE2Y57	507995	489	120 - 452	3813		H0052: 2	
HCE3A30	524460	490	225 - 476	3814	Val-8 to Trp-13, Ser-17 to Gly-27.	H0052: 4, T0010: 1 and L0438: 1.	
HCE3B17	783846	491	30 - 332	3815	Val-6 to Arg-27, Leu-69 to Gly-78.	H0052: 2	
HCE3B57	921135	492	32 - 127	3816		H0052: 2	
HCE3B66	524117	493	142 - 375	3817		H0052: 4	
HCE3C83	932590	494	2 - 127	3818	Gln-9 to Ser-19.	H0261: 2 and H0052: 1.	
HCE3E23	584830	495	280 - 495	3819		H0052: 3	
HCE3E33	524092	496	183 - 371	3820		H0052: 2	
HCE3E62	835536	497	3 - 359	3821	Ala-3 to Ala-12, Ala-31 to Pro-36.	H0052: 3	22q11.2-q13.2 123620, 138720, 145410, 188826, 231950, 239500, 275350, 600850
HCE3F52	524027	498	155 - 268	3822		H0052: 3	
HCE3H42	573710	499	84 - 302	3823		H0052: 2	
HCE3H71	961681	500	275 - 826	3824		AR089: 14, AR061: 10 L0439: 12, L0438: 5, L0741: 4, H0052: 2, H0009: 2, L0769: 2, L0794: 2, H0229: 1, H0572: 1, L0770: 1,	

									L0796: 1, L0789: 1 and L0786: 1.			
HCE3H92	974278	501	250 - 579	3825			Ser-3 to Phe-14.		H0052: 2 and H0201: 2.			
HCE3I35	524029	502	2 - 259	3826			Arg-15 to Gly-22, Glu-25 to Arg-30.		H0052: 2			
HCE3I80	519597	503	21 - 170	3827			Val-25 to Phe-34.		H0052: 2 and H0194: 1.			
HCE3J27	459477	504	284 - 523	3828			Pro-40 to Gly-48.		H0052: 2, H0023: 2, L0438: 1 and L0439: 1.			
HCE3J71	573851	505	172 - 303	3829			Asn-23 to Phe-37.		H0052: 2			
HCE3K96	591923	506	3 - 254	3830			Gln-1 to Tyr-16.		H0052: 2			
HCE3L01	917178	507	3 - 140	3831			Gly-15 to Glu-21.		H0052: 2			
HCE3L17	573694	508	34 - 225	3832					H0052: 2			
HCE3L83	746939	509	228 - 470	3833					H0052: 3			
HCE3P22	674862	510	46 - 285	3834			Pro-20 to Phe-38, Gly-74 to Gly-79.		AR061: 6, AR089: 3, L0439: 3, H0052: 2, L0758: 2, S0222: 1, S0346: 1, S0388: 1 and L0792: 1.			
HCE3P41	530810	511	3 - 233	3835			Gln-1 to Lys-9.		H0052: 2			
HCE3P74	706186	512	40 - 183	3836					H0052: 2			
HCE3P78	773709	513	101 - 352	3837					H0052: 2			
HCE3P92	682279	514	57 - 257	3838			Glu-35 to Arg-43.		H0052: 2			
HCE3Q23	459512	515	164 - 57	3839					H0052: 2			
HCE3Q43	589263	516	80 - 235	3840					H0052: 2			
HCE3Q47	971676	517	135 - 419	3841			Val-23 to Pro-43, Pro-51 to Asn-62,		H0052: 8, H0341: 1, H0194: 1 and L0741: 1.			

HCE3Q60	723241	518	1 - 135	3842	Pro-87 to Pro-93. Ser-1 to Ser-9.	H0261: 2, H0052: 1, L0742: 1 and L0758: 1. H0052: 2		
HCE3Q65	573695	519	3 - 98	3843				
HCE3Q77	953267	520	363 - 698	3844		L0439: 23, L0438: 9, H0052: 3, S0222: 2, L0592: 2, S0001: 1, S0010: 1, S0346: 1, H0172: 1, S0051: 1, S0038: 1, H0144: 1, L0742: 1, L0756: 1 and L0759: 1.		
HCE3Q95	542005	521	103 - 252	3845		H0052: 2		
HCE3T05	932279	522	163 - 309	3846		H0052: 2		
HCE3T42	521869	523	112 - 369	3847	Gln-13 to Ser-31.	H0052: 2		
HCE3U64	678905	524	3 - 197	3848	Arg-12 to Ser-21.	H0052: 2		
HCE3U81	573790	525	208 - 360	3849	Ile-27 to Arg-37.	H0052: 2		
HCE3U90	960142	526	2 - 157	3850		H0052: 5 and H0261: 2.		
HCE3U91	974280	527	262 - 429	3851	Pro-3 to Phe-8.	H0052: 2 and H0261: 1.		
HCE3V57	853130	528	1 - 444	3852		H0052: 1 and T0010: 1.		
HCE3W08	854615	529	465 - 908	3853		S0222: 1, S0010: 1, H0052: 1, L0741: 1 and L0745: 1.		
HCE3W62	753998	530	82 - 207	3854		H0052: 2		
HCE3X47	573690	531	1 - 216	3855	Glu-21 to Arg-29.	H0052: 2		

HCE3Y80	529986	532	30 - 140	3856	Val-10 to Asp-15, Ser-17 to Trp-28.	H0261: 1 and H0052: 1.		
HCE3Z71	853132	533	2 - 370	3857		H0052: 1, H0051: 1 and L0800: 1.	17q25.3	170500, 170500, 170500, 232300, 252900
HCE4B55	573908	534	166 - 309	3858		H0052: 2		
HCE4D51	892880	535	372 - 749	3859		H0052: 3 and L0439: 2.		
HCE4E80	573709	536	3 - 299	3860	Pro-41 to Asp-46, Ala-55 to Ser-64, Ser-69 to Gln-80.	H0052: 2		
HCE4F35	573933	537	3 - 401	3861		H0052: 2		
HCE4G04	795991	538	1 - 240	3862		AR061: 2, AR089: 1 H0052: 2	16p13.3	141750, 141800, 141800, 141800, 141800, 141850, 141850, 141850, 141850, 141850, 156850, 186580, 191092, 600140, 600273,

												601313, 601785
HCE4G63	530976	539	54 - 350	3863							H0052: 2	
HCE4H44	573662	540	129 - 215	3864							H0052: 2	
HCE4H86	523310	541	131 - 301	3865							H0261: 2 and H0052: 1.	
HCE4I05	932276	542	64 - 189	3866							H0052: 1 and H0201: 1.	
HCE4I15	529080	543	1 - 321	3867							H0052: 2	
HCE4I71	573642	544	3 - 101	3868							H0052: 2	
HCE4J68	572981	545	286 - 393	3869							H0052: 1 and S0036: 1.	
HCE4K11	967384	546	108 - 233	3870							H0052: 3	
HCE4L80	775388	547	72 - 155	3871							H0052: 2	
HCE4N22	847308	548	100 - 222	3872							H0052: 2	106100
HCE4N47	836013	549	93 - 395	3873							H0052: 2 and H0261: 1.	
HCE4O32	668756	550	101 - 472	3874							H0052: 1 and H0009: 1.	
HCE4P43	573625	551	240 - 362	3875							H0052: 2	
HCE4Q41	530820	552	37 - 189	3876							H0052: 2	
HCE4R04	615492	553	2 - 346	3877							H0052: 1 and S0050: 1.	

HCE4R23	746699	554	114 - 443	3878	Ser-103 to Leu-114.	H0438: 1 and H0052: 1.		
HCE4T11	967379	555	2 - 256	3879		H0052: 2		
HCE4W03	836548	556	1 - 216	3880	Glu-13 to Val-21, Gly-52 to Cys-66.	H0052: 2		
HCE4W84	879605	557	90 - 221	3881		H0052: 2		
HCE4Y91	529075	558	181 - 408	3882	Leu-35 to Trp-40.	H0052: 2		
HCE4Z16	853117	559	107 - 418	3883	Gly-13 to His-23.	H0052: 2 and L0766: 1.		
HCE5B79	758219	560	22 - 480	3884	Thr-13 to Gln-21, Lys-62 to Leu-67, Arg-78 to Gly-95, Ser-109 to Arg-134.	L0741: 2, H0052: 1 and H0051: 1.		
HCE5B85	529775	561	3 - 158	3885		H0261: 1 and H0052: 1.		
HCE5B90	526422	562	90 - 254	3886	Ser-40 to Asn-46.	H0052: 2		
HCE5C39	960652	563	3 - 122	3887		H0052: 2		
HCE5C65	882226	564	1 - 402	3888		L0742: 9, L0794: 7, L0741: 4, S0007: 2, H0052: 2, L0768: 2, L0439: 2, L0005: 1, H0455: 1, S0049: 1, S0388: 1, L0769: 1, L0796: 1, L0643: 1, L0805: 1 and L0604: 1.		
HCE5E62	757723	565	3 - 140	3889	Val-3 to Pro-10.	H0052: 1 and H0009: 1.		

HCE5F08	849120	566	162 - 320	3890			H0052: 2		
HCE5G03	924772	567	107 - 202	3891			H0052: 2		
HCE5H09	530972	568	1 - 129	3892		Ser-5 to Cys-26.	H0052: 2		
HCE5H59	524820	569	33 - 233	3893		Ala-10 to Glu-17.	H0052: 1 and H0201: 1.		
HCE5I78	934531	570	3 - 422	3894		Pro-14 to Gln-20, Ala-29 to Ala-52, Tyr-64 to Ser-70, Ser-103 to His-120.	AR061: 5, AR089: 2 L0439: 8, H0052: 7, L0741: 7, L0756: 4, S0010: 3, H0261: 2, H0156: 2, S0049: 2, L0770: 2, L0776: 2, L0742: 2, L0745: 2, L0366: 2, S0222: 1, H0438: 1, H0390: 1, S0346: 1, H0009: 1, L0455: 1, S0038: 1, L0789: 1 and L0758: 1.		
HCE5M64	746940	571	1 - 204	3895		Pro-26 to Asn-33, Pro-35 to Trp-50.	H0052: 2		
HCE5M70	530836	572	187 - 309	3896			H0052: 2		
HCE5M79	573789	573	152 - 325	3897		Thr-19 to Ser-26, Gly-32 to Ala-45.	H0052: 3, T0010: 3 and L0741: 1.		
HCEAA56	719484	574	183 - 347	3898			H0007: 1, H0052: 1, L0805: 1, L0747: 1 and L0756: 1.		
HCEBA04	933098	575	197 - 520	3899			H0052: 2 and L0756: 1.		
HCEBA40	520121	576	103 - 297	3900			H0052: 2		

HCEBB65	937643	577	137 - 244	3901		H0261: 1 and H0052: 1.		
HCEBC68	503561	578	7 - 147	3902		H0052: 2		
HCEBC74	921122	579	313 - 68	3903	Ser-1 to Gly-8, Ala-18 to Arg-23, Thr-60 to Arg-67.	H0052: 2		
HCEBD05	932979	580	34 - 138	3904	Cys-1 to Lys-7.	H0052: 3		
HCEBD80	739576	581	1 - 624	3905		L0742: 4, L0769: 3, H0052: 2, H0438: 1, S0388: 1, L0805: 1, L0787: 1, L0741: 1, L0439: 1 and L0756: 1.		
HCEBE20	503510	582	60 - 254	3906	Thr-2 to His-8.	H0052: 2		
HCEBG24	509410	583	236 - 415	3907		H0052: 2		
HCEBG28	921228	584	50 - 382	3908		H0052: 1 and H0201: 1.		
HCEBG32	509408	585	1 - 258	3909		H0052: 2		
HCEBL02	921396	586	121 - 264	3910		H0052: 2		
HCEBM67	509722	587	2 - 172	3911	Val-27 to Thr-32, Gly-39 to Trp-55.	H0052: 2		
HCEBP13	935997	588	1 - 198	3912	Gly-59 to Ser-65.	H0052: 2		
HCEBP17	689751	589	4 - 273	3913	Glu-57 to Ala-62, Ser-70 to Arg-75, Gly-81 to Cys-87.	H0052: 2		
HCEBP39	509337	590	83 - 286	3914		H0052: 1 and H0201: 1.		
HCEBW51	502883	591	72 - 248	3915	Arg-1 to Phe-10.	H0052: 2		
HCEBW63	502885	592	2 - 175	3916		H0052: 2		

HCEBX01	968745	593	3 - 149	3917			H0052: 2		
HCECA67	518467	594	104 - 253	3918	Cys-15 to Ser-20.		H0052: 2		
HCECE07	941819	595	97 - 282	3919	Gln-1 to Tyr-8, His-14 to Trp-21, Glu-38 to Pro-47.		H0052: 1 and S0386: 1.		
HCECE80	509713	596	143 - 283	3920			H0052: 1 and H0194: 1.		
HCECG77	502993	597	96 - 278	3921	Leu-20 to Arg-29.		H0052: 2 and L0748: 1.		
HCECJ58	878507	598	122 - 322	3922	Pro-24 to Glu-34.		H0052: 2		
HCECK37	509757	599	1 - 213	3923	Asn-1 to Ser-13, Gly-28 to Gly-36, Gln-38 to Asp-48, Thr-64 to Ser-69.		H0052: 2		
HCECM21	575529	600	3 - 122	3924	Arg-27 to Trp-32, Arg-34 to Cys-39.		H0052: 1, H0009: 1 and L0769: 1.		
HCECM96	503085	601	32 - 199	3925	Glu-5 to Ser-15.		H0052: 2	1q21.2-q22	104770, 107670, 110700, 145001, 146760, 146790, 159440, 159440, 159440, 186780, 191030, 191315, 600923,

HCECN06	960848	602	81 - 404	3926	Lys-30 to Met-35, Ser-37 to Pro-44, Thr-56 to Pro-62, Met-94 to Gln-100.	H0052: 4	601412, 601652, 601863, 602491
HCECN78	509402	603	2 - 130	3927	Ile-28 to Thr-34.	H0052: 2	
HCECN79	509399	604	143 - 355	3928		H0052: 2	
HCECP13	971678	605	59 - 250	3929	Lys-6 to Trp-13, Pro-15 to Leu-25.	H0052: 2	
HCECP39	509756	606	218 - 430	3930	Arg-1 to Lys-7.	H0052: 2	
HCECP41	509215	607	83 - 199	3931		H0052: 2	
HCECP52	863035	608	2 - 337	3932	Pro-7 to Cys-23, Trp-92 to Ser-98.	H0052: 2	
HCECQ52	850540	609	117 - 317	3933		H0052: 2	
HCECR28	503075	610	146 - 232	3934		H0261: 1, H0052: 1 and H0201: 1.	
HCECS06	960847	611	88 - 345	3935	Arg-13 to Gly-19, Thr-24 to Tyr-34.	H0052: 3	
HCECV03	960991	612	36 - 242	3936	Gly-5 to Ser-13, Thr-25 to Asp-40.	H0052: 2	
HCECW68	926368	613	162 - 362	3937		H0052: 2 and H0261: 1.	
HCEDA24	676723	614	123 - 335	3938	Arg-28 to Ser-33, Gln-44 to Asp-63.	L0439: 3, H0052: 2, L0758: 2, S0222: 1, S0346: 1, S0388: 1 and	

HCEDA38	503011	615	198 - 299	3939			L0792: 1.		
HCEDB02	921291	616	18 - 251	3940		Thr-40 to Lys-51.	H0052: 2		
HCEDB17	795673	617	37 - 402	3941		Arg-19 to Lys-36, Cys-50 to Glu-56, Leu-83 to Trp-90.	H0052: 2		
HCEDB18	526268	618	127 - 420	3942		Gln-1 to Leu-7, Cys-22 to Leu-27, Leu-35 to Asp-42, Gln-61 to Arg-66.	S0222: 1 and H0052: 1.		
HCEDB26	685195	619	94 - 243	3943			H0052: 2		
HCEDB93	508454	620	3 - 275	3944		His-7 to Arg-18, Gly-31 to Thr-36.	H0052: 1, H0567: 1, L0754: 1, L0756: 1 and L0755: 1.		
HCEDD09	508330	621	447 - 995	3945		Ala-21 to Arg-33.	H0052: 2		
HCEDD30	557026	622	250 - 540	3946			S0007: 2, L0439: 2, L0024: 1, H0052: 1 and S0038: 1.		
HCEDF64	742175	623	316 - 432	3947			H0052: 1, H0051: 1 and L0593: 1.		
HCEDF41	526314	624	100 - 291	3948			S0010: 1 and H0052: 1.		
HCEDF60	508327	625	3 - 248	3949			H0052: 2		
HCEDF71	508325	626	220 - 342	3950		Arg-2 to Leu-8.	H0052: 2		
HCEDG13	961050	627	194 - 448	3951		Ser-14 to Gly-21, Gln-41 to Gln-47.	H0052: 2		
HCEDG42	508291	628	89 - 322	3952		Pro-26 to Ser-35, Ser-48 to Leu-58,	L0439: 3, H0052: 1, H0051: 1 and L0741: 1.		

HCEDG48	508252	629				Thr-73 to Thr-78.				
HCEDG66	960603	630	2 - 142	3953			H0052: 2			
			1 - 357	3954		Pro-11 to Ile-16.	H0052: 5 and H0261: 1.			
HCEDI07	954409	631	157 - 324	3955		Thr-34 to His-39.	H0052: 2			
HCEDI15	932975	632	3 - 152	3956		Phe-1 to Thr-9.	H0052: 2			
HCEDI39	666940	633	216 - 332	3957			H0052: 2			
HCEDIJ72	508451	634	205 - 360	3958		His-26 to Gly-32.	H0052: 2, L0439: 2 and L0745: 2.			
HCEDIJ84	508447	635	3 - 149	3959		Lys-6 to Ala-19.	H0052: 2			
HCEDM16	790502	636	107 - 238	3960			L0779: 4, L0766: 3, H0052: 2, L0794: 2, L0809: 1, L0752: 1 and L0758: 1.	20q11.2	139190, 139190, 224100, 601002, 601002, 601146, 601146, 601146	
HCEDO77	508308	637	146 - 304	3961		Pro-1 to Lys-7.	H0052: 2			
HCEDQ53	973791	638	44 - 271	3962			H0052: 3			
HCEDR10	968673	639	3 - 359	3963			S0010: 1 and H0052: 1.	16p12-p13.1	108730, 147781, 172471, 186580, 264800, 266600, 278760, 600760,	

HCEEA18	531000	640	161 - 340	3964	Thr-15 to Asp-21, Asn-24 to Gln-29.	H0052: 2	600760, 600761, 600761, 602066
HCEEA44	503074	641	23 - 256	3965	Leu-6 to Trp-18.	H0052: 2	
HCEEB10	968566	642	128 - 346	3966	Ser-18 to Lys-24.	S0010: 1 and H0052: 1.	
HCEEB31	526586	643	146 - 379	3967	Gly-24 to Leu-29, Gln-56 to Arg-62.	H0052: 2	
HCEEB65	518933	644	32 - 178	3968	Gly-19 to Ser-24.	H0052: 2	
HCEEC48	853025	645	13 - 138	3969	Arg-12 to Lys-19.	H0052: 2	
HCEEE39	530990	646	1 - 153	3970	Gly-9 to Ala-16.	H0052: 2	203800, 602404
HCEEF06	960667	647	3 - 332	3971	Cys-50 to Thr-56, Tyr-59 to Asn-65, Ser-86 to Gly-94.	H0052: 2	
HCEEG96	530995	648	94 - 645	3972	Thr-77 to Asp-82, Ala-87 to Gly-94.	H0052: 2 and L0777: 1.	
HCEEH27	813251	649	2 - 382	3973	Pro-3 to Arg-48, Arg-57 to Leu-63, Glu-82 to Gly-87, Thr-95 to Asn-107.	AR089: 1, AR061: 0 H0052: 2	
HCEEI37	530915	650	1 - 465	3974		AR061: 9, AR089: 6 H0052: 2 and L0439: 1.	
HCEEI51	530920	651	372 - 605	3975	Pro-15 to Gly-22.	H0052: 2 and L0740: 1.	

HCEEI82	507390	652	34 - 255	3976			H0052: 2		
HCEEJ11	967841	653	91 - 258	3977	Pro-17 to Gly-23.		H0052: 2		
HCEEJ30	701745	654	212 - 364	3978			H0052: 1 and H0194: 1.		
HCEEJ42	714237	655	65 - 262	3979			H0261: 1 and H0052: 1.		
HCEEJ88	960531	656	424 - 690	3980			H0052: 5, S0222: 2 and 22q13.1 L0740: 1.	103050, 103050, 124030, 124030, 138981, 182380, 188826, 190040, 190040, 190040	
HCEEM25	591766	657	3 - 260	3981			H0052: 2		
HCEEM28	530842	658	2 - 229	3982			H0052: 1 and H0327: 1.		
HCEEM58	667730	659	50 - 229	3983			H0052: 2		
HCEEM93	533920	660	2 - 172	3984			H0261: 2 and H0052: 1.		
HCEEO58	575400	661	61 - 375	3985	Phe-18 to Gly-24, Leu-34 to His-39.		H0052: 2		
HCEEP40	530914	662	323 - 165	3986			H0052: 2		
HCEEQ78	558150	663	3 - 260	3987	Gly-1 to Arg-18, Asn-35 to Ser-45.		H0052: 1 and H0201: 1.		
HCEER30	530912	664	89 - 256	3988	Pro-12 to Gln-23.		H0052: 2		

HCEER73	968028	665	76 - 381	3989			H0052: 3 and L0752: 1.		
HCEER92	530913	666	104 - 421	3990	Ser-12 to Ser-22, Cys-29 to Thr-34, Ser-64 to His-69.		H0052: 2		
HCEES13	968437	667	3 - 455	3991			H0052: 2 and L0366: 1.		
HCEET44	597016	668	159 - 308	3992	Gln-1 to Gly-8.		H0052: 1 and H0123: 1.		
HCEET55	524113	669	2 - 151	3993			H0052: 3, L0747: 2, S0222: 1 and L0763: 1.		
HCEET66	524442	670	236 - 472	3994			H0052: 2 and H0261: 1.		
HCEET78	530980	671	41 - 256	3995			L0754: 3 and H0052: 2.		
HCEEX95	960737	672	147 - 305	3996			H0052: 2 and H0201: 1.		
HCEEZ03	862977	673	3 - 320	3997	Pro-2 to Lys-14, Thr-34 to Ser-45, Met-77 to Glu-82, Val-92 to His-97.		H0261: 1, S0222: 1, S0010: 1 and H0052: 1.	3p21.31	116806, 168468, 182280, 212138, 600163
HCEEZ69	530905	674	45 - 191	3998	Gln-11 to Asp-16, Pro-38 to Phe-44.		H0052: 2		
HCEFA27	973766	675	431 - 610	3999	Cys-21 to Ser-26.		H0052: 2, H0194: 1, H0201: 1, L0764: 1 and L0608: 1.		
HCEFA43	853018	676	51 - 164	4000			H0052: 2		

HCEFA74	555114	677	2 - 190	4001	His-9 to Cys-24, Ser-32 to His-47.	H0052: 2	5q23.3-q31.2	121050, 131400, 153455, 159000, 179095, 180071, 181460, 192974, 192974, 600807, 601596, 602089
HCEFB25	917216	678	112 - 213	4002		H0052: 2		
HCEFB44	530979	679	86 - 340	4003		H0052: 2		
HCEFC06	960665	680	192 - 356	4004		H0052: 2		
HCEFC22	530973	681	24 - 257	4005	Gly-22 to Gly-27.	H0261: 1 and H0052: 1.		
HCEFC43	715658	682	17 - 208	4006		H0052: 2		
HCEFD48	524452	683	6 - 338	4007		H0052: 2		
HCEFE11	524266	684	3 - 194	4008		H0052: 2		
HCEFE52	850562	685	3 - 269	4009	Met-6 to Thr-14, Leu-50 to Thr-55.	H0052: 2		
HCEFF55	530970	686	3 - 212	4010		H0261: 1 and H0052: 1.		
HCEFH86	526591	687	171 - 314	4011	Thr-4 to Gln-10, Pro-30 to Ser-38.	H0261: 1 and H0052: 1.		
HCEFK20	770007	688	2 - 373	4012	Leu-38 to Ser-43, Ala-56 to Gln-68.	H0052: 12, L0741: 3, H0194: 2, S0222: 1,		

									S0038: 1, L0370: 1 and L0439: 1.			
HCEFK38	530718	689	21 - 176	4013					H0052: 2			
HCEFK64	746979	690	131 - 3	4014					H0052: 2 and L0756: 1.			
	850559	3240	2 - 166	6564								
HCEFO24	503094	691	1 - 267	4015					H0052: 2			
HCEFS39	709591	692	2 - 187	4016					H0052: 2			
HCEGB90	524101	693	100 - 207	4017					H0052: 2			
HCEGD64	881662	694	86 - 979	4018				Gly-94 to Pro-105, Pro-126 to Ala-137, Ser-148 to Ser-154, Cys-172 to Cys-179, Arg-232 to Leu-239, Arg-242 to Pro-254, Lys-276 to His-283.	H0052: 12, L0439: 11, L0741: 7, S0222: 4, L0438: 4, S0110: 2, S0388: 2, L0742: 2, H0462: 1, H0455: 1, H0600: 1, H0618: 1, H0009: 1, S0051: 1, T0010: 1, H0644: 1, L0639: 1, L0759: 1, S0031: 1 and S0260: 1.			
HCEGD83	558000	695	111 - 230	4019					H0052: 2			
HCEGM05	850556	696	384 - 545	4020				Cys-2 to Phe-7.	H0052: 2 and L0748: 1.			
HCEGM90	542495	697	1 - 129	4021				Asn-7 to Gly-25, Lys-31 to Asn-43.	H0052: 1 and S0038: 1.			
HCEGN89	960876	698	38 - 112	4022					H0201: 2 and H0052: 1.			
HCEGS64	585357	699	206 - 409	4023					H0052: 2			
HCEGV16	557909	700	1 - 387	4024				Lys-19 to Gly-44,	H0052: 2			

HCEGY34	889473	701	50 - 340	4025	Arg-46 to Cys-63. Gln-33 to His-42, Pro-55 to Asn-66.	H0052: 3, L0787: 1 and L0758: 1.		
HCEGY46	889474	702	47 - 616	4026	Ala-5 to Leu-19, Gln-62 to His-71, Pro-84 to Ser-104, Ser-115 to Met-121, Tyr-136 to His-150, Pro-162 to Gly-169.	AR050: 16, AR089: 2, AR061: 1 H0052: 2, L0787: 1 and L0758: 1.		
HCEHE67	669223	703	77 - 328	4027	Cys-13 to Lys-22.	H0052: 2		
HCEHF63	770006	704	2 - 457	4028	Leu-31 to Ser-36.	H0052: 12, L0741: 3, H0194: 2, S0222: 1, S0038: 1, L0370: 1 and L0439: 1.		
HCEHJ28	967383	705	2 - 406	4029		L0439: 3, H0052: 2 and S0007: 1.		
HCEHM83	529095	706	2 - 277	4030	Thr-1 to Ala-6.	H0052: 2		
HCEHW07	954156	707	3 - 170	4031	Arg-43 to Lys-56.	H0052: 2		
HCEHW63	577812	708	115 - 342	4032	Gly-13 to Gly-18, Gly-21 to Gln-28, Gly-35 to Lys-47, Ala-54 to Gln-63.	S0010: 1 and H0052: 1.		
HCEIA37	524402	709	2 - 346	4033	Ala-1 to Arg-10.	H0052: 2 and L0791: 1.		
HCEIA78	529076	710	3 - 263	4034		H0052: 2		
HCEIE37	529884	711	182 - 325	4035		H0261: 1 and H0052: 1.		
HCEIP73	578003	712	20 - 184	4036	Pro-19 to His-24.	H0052: 2		

HCEIQ41	529070	713	58 - 360	4037	Met-13 to Ser-25, Ser-56 to Ser-61.	H0052: 1, H0009: 1 and L0605: 1.	
HCEJH32	973283	714	23 - 553	4038	Thr-10 to Thr-17, Gly-49 to Met-56, Ser-64 to Gln-76, Arg-142 to Met-147, Leu-149 to Leu-156, Val-161 to Lys-170.	H0052: 4	
HCEJP71	536163	715	118 - 375	4039		H0052: 2	
HCELA13	862811	716	39 - 101	4040		H0052: 2	
HCEMA55	524936	717	142 - 330	4041	Lys-50 to Trp-57.	H0052: 3, L0741: 3 and H0261: 1.	
HCEMC17	531005	718	215 - 322	4042		H0052: 2	
HCEMC49	524931	719	295 - 408	4043	Lys-13 to His-20.	H0052: 2	
HCEMC86	524929	720	197 - 475	4044	Glu-20 to Pro-25.	H0052: 2	
HCEMC94	530963	721	198 - 359	4045	Val-20 to Trp-25.	H0052: 2	
HCEME91	726585	722	1 - 321	4046	Arg-1 to Ser-6, Pro-57 to Ser-69, Ser-79 to Thr-88.	H0052: 1 and H0567: 1.	
HCEMG78	773788	723	102 - 338	4047	Lys-16 to Gly-28, Gly-49 to Ala-54.	H0052: 2	
HCEMH19	530899	724	1 - 237	4048	Gly-7 to Gly-14.	H0052: 2	
HCEMI10	968560	725	183 - 317	4049	Arg-37 to Tyr-42.	H0261: 1 and H0052: 1.	
HCEMK07	853150	726	94 - 261	4050		H0052: 2 and H0261: 1.	
HCEML04	927898	727	3 - 251	4051	Cys-12 to Asp-21, Ala-59 to Gly-80.	H0052: 2 and L0752: 1.	

HCEMO85	960925	728	3 - 335	4052	Leu-47 to Arg-56, Pro-61 to Leu-67, Gly-95 to Leu-106.	AR089: 1, AR061: 0 H0052: 2		
HCENP77	772669	729	216 - 404	4053	Ala-34 to His-39.	S0001: 1 and H0052: 1.		
HCENR37	530889	730	3 - 197	4054		H0052: 2		
HCENMV51	530828	731	38 - 319	4055	Leu-28 to Thr-37.	H0052: 2		
HCENMZ34	960518	732	469 - 302	4056	Ala-6 to Lys-13, Trp-40 to Glu-50.	T0010: 2, H0052: 1 and L0351: 1.		
HCENMZ61	964940	733	70 - 309	4057	Ser-30 to Gly-37.	H0052: 1, S0038: 1 and L0439: 1.		
HCENNA26	572559	734	1 - 336	4058	Thr-10 to Leu-20.	S6014: 1 and H0052: 1.		
HCENB23	676423	735	2 - 190	4059	Asn-1 to Glu-63.	H0052: 2		
HCENCO9	575404	736	50 - 307	4060	Pro-1 to Ser-10.	H0052: 2		
HCENCC60	526220	737	62 - 139	4061		H0052: 1 and H0194: 1.		
HCENJ44	524100	738	557 - 775	4062	Pro-1 to Tyr-6.	S0038: 2, L0439: 2, H0052: 1 and L0438: 1.		
HCENJ59	739598	739	2 - 214	4063		H0052: 2		
HCENL16	667623	740	1 - 306	4064	Arg-15 to Trp-21.	H0052: 1, S0051: 1 and L0792: 1.		
HCENL90	685271	741	112 - 288	4065	Arg-22 to Val-29, Pro-40 to Thr-56.	H0052: 2		
HCENNM36	585360	742	3 - 263	4066		L0617: 2, L0776: 2, S0049: 1, H0052: 1 and L0805: 1.	22q12.3	138981, 188826, 190040, 190040, 190040, 600850,

HCENM85	524095	743	65 - 286	4067	Lys-44 to Lys-49.	H0052: 3, L0439: 1 and L0779: 1.	601669
HCENP05	932752	744	37 - 138	4068		H0052: 2	
HCENP71	760855	745	368 - 580	4069	Asp-1 to Lys-9.	H0442: 1, H0052: 1, L0754: 1 and L0756: 1.	
HCENP80	775363	746	551 - 727	4070		H0052: 2, L0742: 1 and L0439: 1.	
HCENY05	927908	747	712 - 542	4071	Arg-1 to Lys-6.	H0052: 2, L0756: 2 and L0750: 1.	
HCEOC21	530993	748	37 - 183	4072		H0052: 2, L0363: 1 and L0748: 1.	
HCEOH85	511300	749	450 - 241	4073		H0052: 2	
	878506	3241	2 - 370	6565	Asn-1 to Arg-11.		
HCEOI74	916771	750	2 - 355	4074		S0010: 1 and H0052: 1.	
HCEON10	953849	751	99 - 344	4075	Ala-11 to Gly-20, Glu-27 to Trp-32, Ala-45 to Phe-50, Thr-60 to Pro-75.	H0052: 2	
HCEOR31	720707	752	39 - 425	4076		L0005: 1, S0007: 1, H0052: 1, T0010: 1, L0770: 1, L0769: 1, L0794: 1, L0515: 1 and L0790: 1.	143890, 151440, 600173, 600276, 600310, 600310, 601604, 601843
HCEOU37	530909	753	106 - 456	4077		H0052: 2	

HCEOU87	530813	754	83 - 247	4078	Pro-39 to Asn-44.	H0052: 2		
HCEOW20	944273	755	2 - 421	4079	Ala-1 to Ser-8, Ser-41 to Cys-54, Asn-96 to Asp-103.	AR089: 10, AR061: 9 L0747: 2, S0222: 1, H0052: 1, S6028: 1, L0769: 1, L0768: 1, L0777: 1 and L0366: 1.		
	946967	3242	2 - 421	6566	Ala-1 to Ser-8, Ser-41 to Cys-54, Asn-96 to Asp-103.			
	949234	3243	1847 - 1281	6567	Ala-1 to Gln-7, Lys-24 to Ser-30, Pro-44 to Ser-57, Ser-90 to Cys-103, Asn-145 to Asp-152.			
HCEOY21	530815	756	129 - 260	4080		H0052: 2		
HCEOY43	715644	757	3 - 278	4081	Ile-2 to Leu-17.	S0222: 1, H0052: 1 and L0594: 1.		
HCEOY83	530961	758	10 - 165	4082		H0052: 2		
HCEPF68	960655	759	223 - 444	4083	Val-29 to Thr-38, Pro-48 to Ser-53.	H0052: 5		
HCEPG14	855422	760	152 - 508	4084	Pro-40 to Arg-52.	L0438: 3, H0052: 2, L0439: 2, L0749: 2, L0415: 1, S6026: 1, L0782: 1, L0809: 1, L0352: 1 and L0777: 1.		
HCEPK67	850508	761	1 - 189	4085	Asp-12 to Ala-23.	H0052: 2		
HCEPK95	530799	762	12 - 152	4086	Pro-4 to Trp-14, Ser-27 to Thr-37.	H0052: 1 and H0051: 1.		

HCEPN79	709219	763	266 - 490	4087	Pro-6 to Arg-12, Leu-22 to Asp-30, Val-33 to Ser-40.	H0392: 1 and H0052: 1.		
HCEPS86	530523	764	2 - 142	4088	Gly-11 to Ser-21.	H0052: 2		
HCEPT44	715779	765	113 - 301	4089	Ala-11 to Gln-17, Pro-29 to Gly-37.	S0222: 1, H0052: 1, S0386: 1 and L0366: 1.		
HCEPU04	927871	766	1 - 153	4090		H0052: 2		
HCEPU65	530521	767	19 - 120	4091		H0052: 2		
HCEQA24	678333	768	24 - 119	4092		H0261: 1 and H0052: 1.		
HCEQA80	530514	769	228 - 362	4093		H0052: 2		
HCEQD04	927873	770	1 - 354	4094	Glu-2 to Cys-11, Glu-29 to Ala-47, Asp-80 to Pro-86.	AR061: 5, AR089: 4 H0052: 2		
HCEQE31	530512	771	81 - 389	4095	Ala-1 to Gln-6, Lys-40 to Thr-46, Phe-48 to Arg-54.	H0052: 1, L0439: 1 and S0021: 1.		
HCEQE38	526095	772	201 - 362	4096	Thr-38 to Lys-43.	H0052: 1 and H0201: 1.		
HCESB14	519858	773	54 - 407	4097	Asn-34 to Leu-43, Lys-72 to Gln-79, Asp-84 to Gly-95, Arg-112 to Arg-118.	H0052: 1, H0194: 1 and L0439: 1.	9q34.	125270, 125270, 128100, 137350, 191100, 215700, 223360, 268900, 601850

HCESB16	927985	774	2 - 265	4098	Ser-33 to Phe-41, Ser-48 to Glu-53.	H0194: 2 and H0052: 1.		
HCESB76	921829	775	169 - 543	4099		H0194: 1, L0777: 1 and S0031: 1.		
HCESC58	509328	776	289 - 486	4100		H0261: 1, H0052: 1 and H0194: 1.		
HCESC95	862781	777	2 - 391	4101	Ile-1 to Ser-9, Gly-15 to Gly-22, Trp-33 to Gly-39.	H0194: 1 and S0038: 1.		
HCESG11	967901	778	49 - 135	4102		H0194: 2		
HCESG13	872191	779	94 - 354	4103	Gln-1 to Trp-10.	H0261: 1, H0052: 1, H0194: 1 and S0036: 1.		
HCESG17	526120	780	98 - 373	4104	Ile-1 to Trp-15, Pro-49 to Tyr-56, Phe-59 to Val-65.	H0052: 1 and H0194: 1.	6p21.3	106300, 108800, 120290, 120290, 120810, 120820, 142857, 142858, 150270, 167250, 170261, 177900, 179450, 201910, 217000, 222100, 233100,

HCESG32	537330	781	596 - 895	4105	Pro-25 to Ser-32, Trp-44 to His-52, Arg-63 to Cys-69.	L0748: 2, H0052: 1, H0194: 1, H0051: 1 and L0743: 1.	235200, 248611, 256550, 256550, 600202, 600261, 601868, 602280, 602475
HCESG49	723294	782	3 - 218	4106		H0194: 2 and L0748: 1.	
HCESH15	526166	783	107 - 346	4107	Thr-23 to Trp-28, Ile-32 to Gly-40.	H0052: 1 and H0194: 1.	
HCESH74	526129	784	225 - 326	4108		H0194: 2	
HCESP25	921882	785	35 - 169	4109		H0194: 2	
HCESP45	526128	786	73 - 210	4110		H0052: 1 and H0194: 1.	
HCESP56	827671	787	147 - 512	4111	Asp-15 to Thr-21, Gln-83 to Ile-91.	AR061: 8, AR089: 5 H0052: 3, S0282: 1, H0194: 1, H0009: 1, L0789: 1, L0602: 1 and L0439: 1.	6p22.3-p22.1 187680
HCESP63	894042	788	5 - 88	4112		H0194: 2	
HCES50	862783	789	105 - 1	4113		H0194: 2	
HCES585	916767	790	409 - 627	4114	Leu-3 to Glu-13, Gly-18 to Thr-25.	S0222: 1, H0438: 1, S0010: 1, H0194: 1,	

HCEST23	525888	791	68 - 217	4115			H0562: 1, T0010: 1, S6028: 1, L0769: 1 and L0439: 1.		
HCEST57	525884	792	129 - 305	4116	Pro-38 to Cys-45.		H0052: 1 and H0194: 1.		
HCESX37	429110	793	2 - 334	4117	Asn-7 to Glu-20, His-77 to Lys-82.		H0194: 2		
HCESX44	716921	794	1 - 171	4118	Phe-5 to His-22.		H0052: 1 and H0194: 1.		
HCEZ92	525968	795	26 - 196	4119			H0052: 1, H0194: 1 and L0456: 1.		
HCEZ93	525937	796	47 - 238	4120			H0194: 2		
HCETC01	961016	797	79 - 432	4121	Pro-1 to Trp-9.		H0194: 2		
HCETC63	884070	798	1 - 219	4122			H0052: 2 and H0194: 1.		
HCETC67	525812	799	71 - 250	4123			H0052: 1 and H0194: 1.		
HCETC82	795486	800	97 - 336	4124	Glu-1 to Pro-6, Val-10 to Arg-15.		H0052: 1 and H0194: 1.		
HCETE94	519818	801	2 - 289	4125			H0194: 3		
HCETF60	526105	802	45 - 212	4126			S0007: 2, H0052: 1 and H0194: 1.		
HCETL69	519728	803	31 - 165	4127			H0194: 1 and H0201: 1.		
HCETL74	525806	804	29 - 208	4128	Gln-1 to Gln-8.		H0194: 2 and H0052: 1.		
HCETL82	780206	805	61 - 213	4129	Pro-1 to Ser-6.		H0194: 2		
							H0194: 1 and H0201: 1.		

HCEVM69	954208	806	27 - 401	4130	Pro-21 to Gln-31, Pro-39 to Ser-44.	1.	H0052: 1 and H0194: 1.		
HCEVM73	933220	807	3 - 128	4131			H0194: 2		
HCEVM29	526073	808	118 - 243	4132	Leu-4 to Asn-10.	2.	L0758: 3 and H0194: 2.		
HCEVVD37	880321	809	227 - 502	4133	Met-66 to Arg-72.		H0052: 6, L0741: 4, H0261: 1 and L0750: 1.		
HCEVVF35	862758	810	218 - 421	4134	Gly-1 to Cys-10.		H0261: 2, H0052: 1 and L0749: 1.		
HCEVVF63	526525	811	12 - 236	4135	Pro-14 to Gly-19, Lys-65 to Lys-70.	1.	H0261: 1 and H0052: 1.	141750, 141800, 141800, 141800, 141800, 141850, 141850, 141850, 141850, 141850, 141850, 156850, 186580, 191092, 600140, 600273, 601313, 601785	
HCEVVF92	524010	812	2 - 136	4136	Arg-2 to Phe-9.		H0261: 2		
HCEVH33	530668	813	1 - 198	4137	Asn-12 to Asn-21.		H0261: 1, H0052: 1		

HCEVH53	723465	814	15 - 464	4138	Gly-30 to Ala-49, Ser-61 to Pro-70.	and S6028: 1. H0261: 1, S0051: 1 and L0438: 1.		
HCEVI50	932608	815	39 - 194	4139	Pro-9 to Lys-14, His-19 to Ser-33, Ser-35 to Thr-43.	H0261: 2		
HCEVI53	920952	816	29 - 187	4140	Leu-40 to Cys-47.	H0261: 2		
HCEVK30	529362	817	2 - 229	4141		H0261: 2		
HCEVM32	529708	818	2 - 103	4142	Gly-29 to Pro-34.	H0261: 1 and H0052: 1.		
HCEVM68	828093	819	249 - 371	4143		H0261: 2		
HCEVP10	968448	820	8 - 142	4144		H0261: 1 and S0386: 1.		
HCEVP32	932632	821	191 - 310	4145		H0261: 2		
HCEVQ65	530078	822	78 - 245	4146		H0261: 2		
HCEVR38	529054	823	177 - 350	4147	Ser-4 to Ser-11, Glu-20 to Thr-26.	H0261: 2		
HCEVR49	529060	824	143 - 253	4148	Tyr-2 to Glu-23, Ser-29 to Ile-34.	H0261: 2		
HCEVS07	954120	825	2 - 247	4149		H0261: 2		
HCEVV53	927671	826	217 - 134	4150		H0261: 2		
HCEWD45	721753	827	2 - 313	4151	Trp-23 to Leu-33, Gly-51 to His-56, Pro-58 to Met-75, Leu-85 to Pro-93.	L0742: 18, L0776: 5, L0777: 5, L0806: 4, L0743: 4, L0731: 4, L0770: 3, L0803: 2, L0439: 2, L0752: 2, L0366: 2, H0261: 1, S0010: 1, L0769: 1, L0651: 1, L0805: 1,		

HCEWE14	557913	828					L0745: 1, L0779: 1, L0753: 1 and L0758: 1.		
HCEWE61	927680	829	3 - 230	4152	Glu-12 to Gly-25.		H0261: 2		
HCEWG75	733809	830	3 - 329	4153	Pro-27 to Trp-39, His-41 to Pro-49.		H0261: 2		
HCEWM33	850464	831	118 - 294	4154	Phe-3 to Ser-8.		H0052: 2 and H0261: 1.		
HCEXK06	933127	832	36 - 128	4155			H0261: 1 and H0052: 1.		
HCEYF29	530026	833	113 - 328	4156	Gln-63 to Pro-71.		H0261: 1 and H0052: 1.		
HCEZR33	578001	834	3 - 146	4157	Gly-1 to Asp-15, Leu-19 to Gly-26, Ser-28 to Asp-45.		H0261: 2		
HCEZR71	760859	835	126 - 257	4158			H0261: 1 and S0051: 1.		
HCEZS09	867770	836	33 - 221	4159			H0261: 1 and H0052: 1.		
HCEZU08	960216	837	3 - 290	4160	Gln-1 to Leu-8.		H0261: 1 and H0052: 1.		
HCEZW67	529931	838	39 - 197	4161			H0261: 1, H0052: 1 and L0612: 1.		
HCPAA81	471234	839	233 - 349	4162	Arg-25 to Phe-32.		H0261: 2		
HCPAB64	524797	840	1 - 210	4163			S0282: 1, H0340: 1 and L0439: 1.		
HCRAA32	542494	841	16 - 171	4164			H0340: 2		
HCRAE82	507879	842	1 - 150	4165	Pro-11 to Thr-16.		H0327: 1 and S0050: 1.		
HCRAK20	529261	843	3 - 62	4166	Lys-9 to Pro-20.		H0327: 2		
			6 - 191	4167			H0327: 2 and L0754:		

HCRAQ67	529253	844	43 - 168	4168	Arg-1 to Val-19, Glu-33 to Arg-42.	2. H0327: 2		
HCRAR86	529258	845	41 - 226	4169	Pro-17 to Ser-23.	H0327: 2		
HCRAX07	857686	846	174 - 446	4170	His-2 to Gln-13.	H0327: 1 and H0051: 1.		
HCRAZ34	529304	847	60 - 302	4171	Arg-1 to Gly-16, Pro-32 to Ser-39.	H0327: 2		
HCRBI55	659621	848	30 - 317	4172		L0756: 3, S0300: 1, H0327: 1, S0388: 1, L0598: 1 and S0412: 1.		
HCRBR35	577804	849	190 - 300	4173	Ser-6 to Gln-19.	H0327: 1 and S0051: 1.		
HCRBZ96	529032	850	1 - 132	4174		H0327: 2		
HCRCA29	754319	851	295 - 167	4175	Pro-8 to Gln-16, Asp-30 to Glu-35.	S0222: 1, S0049: 1, H0327: 1, H0051: 1 and L0439: 1.		
HCRCB77	528055	852	1 - 195	4176	Lys-16 to Lys-26, Lys-36 to Pro-43, Pro-45 to Gly-53.	H0327: 2		
HDFEA20	669551	853	209 - 385	4177		H0052: 1, H0563: 1 and L0439: 1.		
HDFEB08	959123	854	353 - 574	4178		L0439: 4, L0770: 3, L0756: 2, H0052: 1, H0563: 1, H0172: 1, L0598: 1, L0662: 1, L0805: 1, L0666: 1, L0777: 1 and L0759: 1.		
HDFMA69	754948	855	70 - 219	4179		S0222: 1, H0565: 1,		

HDFQA13	656814	856	122 - 424	4180	Asn-13 to Pro-19, Gln-34 to Ser-41.	L0438: 1 and L0592: 1. H0052: 1 and H0566: 1.		
HDFQA51	926374	857	3 - 470	4181	Lys-7 to Phe-21.	H0566: 1, L0756: 1 and S0260: 1.		
HDFQA79	926334	858	1 - 171	4182	Met-11 to Gln-22.	S6024: 1, S0222: 1, H0566: 1, S0051: 1 and L0753: 1.		
HDFQB47	720155	859	15 - 197	4183	Lys-1 to Ser-6, Arg-32 to Leu-44.	S0001: 1 and H0566: 1.		
HDFUA42	713592	860	123 - 278	4184	His-17 to Gly-24.	H0052: 2, H0567: 1 and L0366: 1.		
HDFUB08	959091	861	3 - 185	4185		H0567: 2 and H0570: 1.		
HDHEB77	772051	862	334 - 477	4186		H0570: 1 and H0051: 1.		
HDHIA83	488088	863	151 - 363	4187	Lys-9 to Met-15, Arg-27 to Asn-32, Asn-38 to His-43, Met-59 to Ser-64, Cys-66 to Asp-71.	H0571: 1, S0050: 1 and S0051: 1.		
HDHIA91	789455	864	29 - 289	4188	Ser-7 to Gln-12, Arg-35 to Gly-54.	H0261: 1, H0571: 1, L0438: 1 and L0439: 1.		
HDJMA92	865118	865	313 - 462	4189		S0400: 1 and S0346: 1.		
HDJME64	746167	866	87 - 284	4190		S0400: 2		
HDJMF70	756909	867	74 - 190	4191		S0400: 2		
HEBAA48	509460	868	91 - 210	4192	Thr-7 to Leu-22.	S0007: 2		
HEBAD64	851268	869	88 - 474	4193		L0439: 3, S0007: 2,		

									L0157: 2, L0438: 2, L0005: 1, L0769: 1, L0776: 1, L0780: 1 and L0608: 1.			
HEBAE34	519743	870	3 - 131	4194					S0007: 2			
HEBAE75	508766	871	198 - 353	4195					S0007: 2			
HEBAF55	508520	872	200 - 349	4196			Cys-36 to Gly-41.		S0007: 2			
HEBAF68	508521	873	303 - 494	4197					S0007: 2 and S0222: 1. Xq22.3-q23		300046, 300067, 300067, 300121, 300121, 300121, 301201, 301835, 311850	
HEBAG22	973705	874	40 - 348	4198			Pro-15 to Cys-21, Ala-26 to Ser-32, Arg-41 to Ser-48.		S0007: 3			
HEBAG26	508517	875	101 - 313	4199					S0007: 2			
HEBAG77	508510	876	258 - 413	4200					S0007: 2			
HEBAH35	558121	877	124 - 366	4201			Arg-1 to Asn-9, Pro-40 to Asn-45, Gly-55 to Arg-60.		S0007: 2			
HEBAH71	519449	878	366 - 509	4202			Leu-37 to Lys-48.		L0439: 4, S0007: 3, L0754: 1 and L0747: 1.			
HEBAJ34	934606	879	1 - 375	4203					S0001: 1, S0007: 1 and H0051: 1.			
HEBAN86	973770	880	174 - 299	4204			Leu-1 to Arg-8.		S0007: 3			

HEBAO82	524984	881	72 - 353	4205	Phe-10 to His-15.	S0007: 2	
HEBAQ29	578225	882	2 - 187	4206	Ser-4 to Gln-13.	S0007: 2	
HEBAR51	524860	883	21 - 167	4207	Met-7 to Gly-15.	S0007: 2, L0794: 2 and L0789: 1.	
HEBAT01	921819	884	102 - 563	4208		S0007: 2 and L0761: 1.	
HEBAU35	507404	885	50 - 274	4209		S0007: 2	
HEBBF57	524558	886	3 - 176	4210		S0007: 3 and L0794: 1.	
HEBBH04	927936	887	306 - 590	4211	Arg-8 to Gly-13.	S0007: 2, L0477: 1 and L0471: 1.	
HEBBI35	524976	888	69 - 200	4212		S0007: 2	
HEBBN76	534393	889	5 - 148	4213	Lys-1 to Cys-9, Gln-41 to Glu-48.	S0007: 4, L0774: 2, L0748: 1 and L0759: 1.	
HEBBR08	960258	890	2 - 115	4214		S0007: 2	
HEBBS59	750843	891	74 - 286	4215		S0007: 2	
HEBBW56	733700	892	81 - 191	4216	Glu-16 to Leu-24.	S0007: 2	
HEBBX83	780265	893	1 - 333	4217	Asn-1 to Arg-8.	S0007: 2	
HEBBY81	509326	894	74 - 196	4218	Ile-21 to Thr-27.	S0007: 2	
HEBCH60	529985	895	91 - 204	4219	Gln-1 to Leu-9, Glu-32 to Asn-38.	S0007: 2	
HEBCI43	529981	896	42 - 227	4220	Tyr-1 to Thr-7, Val-28 to Asp-44, Leu-50 to Leu-56.	S0007: 2	
HEBCI49	502991	897	1 - 216	4221		S0007: 2 and H0052: 1.	
HEBCI77	529980	898	76 - 279	4222	Ile-33 to Thr-38, His-47 to His-53.	S0007: 2	
HEBCM14	972465	899	257 - 421	4223		S0007: 4	
HEBCM34	523188	900	7 - 153	4224	Ile-12 to Tyr-17.	S0007: 3 and L0776: 1.	
HEBCX59	825820	901	3 - 164	4225		S0007: 2	

HEBDD06	954653	902	13 - 222	4226	Ser-1 to Gly-7, Arg-10 to Phe-20, Pro-37 to Arg-45.	S0007: 3		
HEBDD53	865374	903	2 - 259	4227		S0007: 4 and H0123: 1, 4q34	189800	
HEBDF46	529130	904	3 - 125	4228		S0007: 2, L0519: 1 and L0779: 1.		
HEBDG53	577824	905	7 - 108	4229	Arg-10 to Trp-16.	S0007: 3		
HEBDG62	529139	906	285 - 440	4230	Lys-3 to Lys-16, Ile-28 to Gly-34.	S0007: 2 and L0439: 1.		
HEBDI15	534394	907	56 - 436	4231		S0007: 6, L0439: 2, L0769: 1, L0438: 1 and L0756: 1.		
HEBDI23	921508	908	1 - 126	4232	Arg-14 to Val-27.	S0007: 3		
HEBDJ02	917304	909	19 - 192	4233	Thr-33 to Gln-43.	S0007: 3		
HEBDL08	960145	910	110 - 337	4234		S0007: 2		
HEBDL22	577825	911	350 - 454	4235	Ser-5 to Leu-10.	S0007: 2 and L0748: 1.		
HEBDM91	529704	912	1 - 117	4236	Pro-20 to Gly-29.	S0007: 1 and H0052: 1.		
HEBDQ92	924563	913	1 - 180	4237	Asn-12 to Ser-18, Lys-35 to Lys-45.	S0007: 3		
HEBDV30	521953	914	56 - 229	4238		S0007: 2		
HEBDW56	529029	915	171 - 359	4239		S0007: 2 and L0439: 1.		
HEBDX47	927673	916	127 - 369	4240	Lys-13 to Ser-21, Arg-51 to Lys-56.	S0007: 3, L0770: 2, L0794: 2, S0282: 1, H0567: 1, L0769: 1, L0789: 1, L0791: 1, L0666: 1 and L0759: 1.		
HEBEA14	541958	917	2 - 100	4241		S0007: 2	6p21.3	106300, 108800,

HEBEC25	920699	918	3 - 212	4242	His-1 to Pro-8, Thr-18 to Ser-27.	S0007: 3	120290, 120290, 120810, 120820, 142857, 142858, 150270, 167250, 170261, 177900, 179450, 201910, 217000, 222100, 233100, 235200, 248611, 256550, 256550, 600202, 600261, 601868, 602280, 602475
HEBED06	933218	919	2 - 139	4243	Arg-1 to Gly-8, Arg-17 to Lys-22.	S0007: 2	
HEBED28	685676	920	166 - 327	4244		S0007: 2	

HEBEF46	507231	921	227 - 331	4245		S0007: 2		
HEBEI75	880693	922	175 - 270	4246		S0007: 2 and L0757: 1.		
HEBEJ49	531731	923	2 - 532	4247	Thr-72 to Asp-80, Asn-93 to Pro-101.	S0007: 6 and L0809: 1.		
HEBFB12	881435	924	1 - 108	4248		S0007: 2		
HEBFD25	575736	925	1 - 339	4249	Gly-1 to Ala-11.	S0007: 2		
HEBFE89	967765	926	58 - 336	4250	Lys-49 to Lys-62, Leu-84 to Gln-93.	S0007: 2		
HEBFF64	577827	927	2 - 154	4251	Leu-10 to His-16.	S0007: 2		
HEBFG12	970847	928	131 - 274	4252	Thr-31 to Pro-43.	S0007: 2		
HEBFG26	681933	929	58 - 2	4253	Lys-11 to Val-17.	S0007: 2		
HEBFH33	529134	930	2 - 394	4254		S0007: 3		
HEBFI64	927684	931	61 - 444	4255	Pro-5 to Gln-12.	S0007: 4		
HEBFL75	577829	932	1 - 189	4256	Arg-11 to Lys-16, Arg-34 to Lys-40.	S0007: 2		
HEBFM03	928641	933	2 - 298	4257	Ser-1 to Ser-16, Leu-37 to Arg-46, Asp-66 to Cys-75, Pro-82 to Gly-88.	S0007: 2		
HEBFM07	953509	934	29 - 247	4258	Glu-1 to Gln-8, Pro-11 to Arg-16, Arg-24 to Ser-31.	S0007: 2		
HEBFN27	851242	935	184 - 381	4259	Arg-1 to Lys-8.	S0007: 5		
HEBFN67	970836	936	127 - 234	4260		S0007: 3		
HEBFO37	706909	937	2 - 310	4261	Ala-1 to Gly-12.	S0007: 2		
HEBFP52	578075	938	89 - 217	4262	Arg-1 to Asn-6.	S0007: 2		
HEBFP55	577826	939	111 - 362	4263	Gly-23 to Gly-35, Ser-47 to His-60.	S0007: 2		

HEBFS81	529982	940	188 - 346	4264	Gly-20 to Ser-25.	S0007: 4 and L0777: 1.	
HEBFT93	577800	941	41 - 187	4265		S0007: 2	
HEBFV08	933072	942	279 - 1	4266	His-26 to Ser-33.	S0007: 2, T0010: 1 and L0605: 1.	
HEBFV36	706913	943	85 - 189	4267	Thr-1 to Ser-6.	S0007: 2	
HEBFX66	529998	944	1 - 288	4268	Gly-8 to Pro-16.	S0007: 4	
HEBGC06	935659	945	22 - 126	4269		S0007: 2	
HEBGC21	954240	946	13 - 207	4270	Ser-3 to Lys-21.	S0007: 4 and H0363: 1.	
HEBGC54	972574	947	3 - 200	4271	Gly-48 to Tyr-65.	S0007: 4, S0049: 1 and H0052: 1.	
HEBGG03	924548	948	93 - 245	4272	Thr-1 to Gln-6.	S0007: 1 and S0412: 1.	
HEBGJ31	791128	949	65 - 268	4273	Ala-13 to Trp-19, Ser-33 to Val-39, Gln-57 to Gly-63.	L0647: 2, L0742: 2, S0007: 1, S0049: 1, S0388: 1, L0773: 1 and L0786: 1.	
HEBGJ36	968424	950	148 - 384	4274	Cys-4 to Gln-16.	S0007: 2, L0748: 1 and L0749: 1.	
HEBGJ55	732183	951	80 - 235	4275	Glu-5 to Thr-11, Thr-29 to Gly-47.	S0007: 2 and L0747: 1.	
HEBGM85	967877	952	118 - 234	4276		S0007: 2	
HEBGO41	973541	953	20 - 238	4277	Pro-19 to Gln-29, Pro-65 to Ala-73.	S0007: 5	
HEYAA37	581053	954	1400 - 930	4278	Ala-18 to Asn-23, Arg-62 to Asn-70, Trp-129 to Asn-137, Gln-141 to Cys-149.	T0074: 1 and S0050: 1.	
HEYAA54	921197	955	138 - 4	4279	Gln-26 to Arg-35.		
HEYAA62	933123	956	217 - 2	4280	Lys-1 to Ser-18,	T0074: 2	
						T0074: 2	

[illegible]

HFADL91	735190	970	534 - 142	4294			S6024: 2, L0439: 2 and T0010: 1.		
HFADM94	675793	971	366 - 632	4295	Gln-29 to Pro-35, Thr-54 to Ala-60.		S6024: 1, S0282: 1 and S0260: 1.		
HFADR30	854428	972	72 - 260	4296			S6024: 1 and S0001: 1.		
HFADR54	967615	973	3 - 227	4297			S6024: 2		
HFADR79	774818	974	1 - 120	4298	Pro-17 to Asp-24.		S6024: 2		
HFADS45	717608	975	50 - 517	4299	Glu-1 to Arg-8.		S6024: 1, S0007: 1, L0769: 1, L0639: 1 and L0790: 1.		
HFADT62	668887	976	3 - 323	4300			L0769: 4, S6024: 1, S0007: 1, L0432: 1 and L0794: 1.	11p15.5	125852, 126452, 126452, 141900, 141900, 141900, 141900, 141900, 141900, 141900, 142000, 142000, 142000, 142200, 142250, 142270, 176730, 176730, 176730, 190020, 191290,

HFADX80	725751	977	127 - 270	4301	Arg-31 to Arg-41.	S6024: 1 and S0010: 1.	192500, 192500, 194071, 194071, 204500, 600856, 601680, 602631, 602631
HFADY29	690463	978	3 - 197	4302	Ser-19 to Asn-25, Ile-31 to Arg-37.	L0771: 2, L0666: 2, L0755: 2, S6024: 1, H0123: 1, L0650: 1, L0792: 1, L0750: 1, L0779: 1, L0777: 1 and S0031: 1.	
HFAEF19	934415	979	341 - 526	4303	Lys-47 to Lys-54.	S6024: 1, L0351: 1, L0770: 1, L0439: 1 and S0412: 1.	
HFAMC50	724427	980	79 - 408	4304	Pro-56 to Glu-64.	L0805: 3, L0776: 2, S6024: 1, L0617: 1, S6026: 1, L0768: 1 and L0779: 1.	
HFAMG12	970745	981	32 - 289	4305	Cys-5 to Thr-29, Pro-36 to Ser-41.	S6026: 1 and H0051: 1.	
HFANA18	665876	982	2 - 181	4306		S6026: 1 and H0327: 1.	
HFAPX43	715033	983	100 - 267	4307		S0282: 1 and S6026: 1.	
HFASN62	835510	984	40 - 171	4308	Gln-2 to Ser-7.	S6024: 1 and S0300: 1.	
HFASO88	780106	985	238 - 462	4309	His-21 to Asn-28.	L0745: 3, L0746: 2,	

									S0300: 1, S0049: 1 and L0756: 1.			
HFATA86	782062	986	2 - 178	4310					S6026: 1 and S0300: 1.			
HFATI26	681306	987	140 - 280	4311					S0300: 2			
HFATL60	974575	988	1 - 123	4312					H0009: 3 and S0300: 1.			
HFATM24	771898	989	155 - 325	4313					S0300: 2			
HFATM96	742711	990	217 - 348	4314					S0300: 2			
HFATZ64	891076	991	61 - 219	4315				Ser-8 to Glu-15.	S0300: 2			
HFAUA63	507883	992	2 - 166	4316				Lys-1 to Ser-10, Asp-28 to Phe-39.	S0007: 4, L0754: 2, L0747: 2 and S0300: 1.			
HFAUN28	686170	993	76 - 276	4317				Glu-49 to Trp-54.	S6026: 1, S0300: 1 and L0779: 1.			
HFAUO42	953266	994	65 - 286	4318				Thr-9 to Asn-24, Pro-26 to Pro-40.	S0300: 1, H0462: 1 and L0756: 1.			
HFAUQ51	725485	995	104 - 238	4319					L0439: 6, L0438: 3, L0759: 2, S0300: 1, H0051: 1, L0794: 1, L0805: 1, L0352: 1, L0742: 1, L0780: 1 and L0758: 1.			
HFBDU55	732570	996	502 - 131	4320				Ala-1 to Asp-6, Ala-17 to Lys-24, Gln-31 to Gln-36.	S0001: 1 and N0006: 1.			
HFCADI4	968734	997	5 - 169	4321				Lys-46 to Phe-52.	H0009: 2 and L0758: 1.			
	968735	3244	489 - 259	6568				Pro-33 to Arg-39, Ser-49 to Tyr-58, Val-61 to Met-70.				

HFCAP03	960978	998	121 - 348	4322			H0009: 2 and L0522: 1.		
HFCAP48	504527	999	3 - 170	4323	Ser-28 to Asn-36.		H0009: 2		
HFCAP92	504522	1000	18 - 308	4324			H0009: 2		
HFCAPJ01	522322	1001	220 - 387	4325	Ile-28 to Gly-35.		H0009: 2		
HFCAP24	415572	1002	8 - 214	4326	Arg-1 to Asn-30.		H0009: 1, H0564: 1, L0766: 1, L0663: 1 and L0759: 1.		
HFCAP33	503496	1003	57 - 314	4327	Ser-44 to Cys-55.		H0009: 2		
HFCAS86	503349	1004	3 - 257	4328	Gly-1 to Phe-13, Ser-33 to Pro-51, Gly-70 to Thr-75.		H0052: 1 and H0009: 1.		
HFCAPU16	503345	1005	38 - 214	4329			H0009: 2		
HFCAPU77	964315	1006	285 - 593	4330	Ser-20 to Pro-25.		L0805: 4, L0439: 3, S6028: 2, L0776: 2, L0438: 2, H0009: 1, H0172: 1, S0036: 1, L0741: 1 and L0756: 1.		
HFCAPV45	870116	1007	295 - 459	4331	Ser-1 to Leu-13, Pro-15 to Glu-26.		L0539: 1, H0009: 1 and S0036: 1.		
HFCAPW07	954481	1008	5 - 208	4332			S0007: 1 and H0009: 1.		
HFCBAI5	502717	1009	123 - 293	4333	Asn-49 to Ser-57.		H0009: 2		
HFCBA57	564250	1010	3 - 242	4334			AR061: 4, AR089: 3, L0756: 4, L0439: 2, S0412: 2, S0222: 1, H0327: 1, H0009: 1, L0157: 1 and S0031: 1.		
	618300	3245	3 - 170	6569	Lys-5 to Leu-14.				

	938141	3246	95 - 595	6570	Arg-7 to Trp-12.			
HFCBC23	502977	1011	100 - 201	4335	Phe-1 to Leu-6.	H0009: 2		
HFCBM03	960990	1012	16 - 192	4336	Asp-1 to Thr-6.	H0009: 2		
HFCBM11	967997	1013	57 - 278	4337	Ser-18 to Ala-33, Lys-43 to Arg-48.	H0009: 2		
HFCBP37	536638	1014	33 - 254	4338	Ala-1 to Cys-13, Lys-22 to His-29, Leu-61 to Ser-66, Thr-69 to Phe-74.	H0009: 1 and T0010: 1.		
HFCBQ17	855395	1015	345 - 512	4339	Arg-15 to Leu-24, Cys-29 to Cys-37, Ala-45 to Arg-50.	H0009: 6		
HFCBQ25	965466	1016	232 - 2	4340		H0009: 8		
HFCBQ46	674616	1017	309 - 470	4341	Arg-18 to Lys-31.	H0009: 2, L0439: 2, S0001: 1 and S0222: 1.	19p12	601843
HFCBS26	526285	1018	104 - 277	4342	Pro-14 to Pro-21, Glu-49 to Arg-58.	H0009: 2		
HFCBT58	508163	1019	9 - 314	4343		H0052: 1 and H0009: 1.		
HFCBT59	783890	1020	87 - 347	4344	Pro-3 to Gly-14.	H0009: 2 and L0750: 1.		
HFCCC43	558170	1021	198 - 287	4345		H0009: 3		
HFCUC94	973281	1022	3 - 131	4346		H0009: 5		
HFCDF85	529524	1023	122 - 322	4347	Leu-36 to Thr-46.	H0009: 2		
HFCDK62	855372	1024	224 - 391	4348		H0009: 2		
HFCDL61	527984	1025	151 - 402	4349	Gly-27 to His-34.	H0009: 2 and L0605: 1.		
HFCDS05	932268	1026	1 - 177	4350	Thr-1 to Asp-6.	H0009: 2		

HFCDT95	975471	1027	166 - 372	4351	Glu-51 to Val-56.	H0009: 2	
HFCDV17	573607	1028	24 - 275	4352		H0009: 2	
HFCDV35	573591	1029	48 - 353	4353	Gln-35 to Trp-48, Leu-51 to His-56.	H0009: 2	
HFCDW26	573593	1030	202 - 333	4354	Lys-1 to Phe-15.	H0009: 2	
HFCDW27	917042	1031	128 - 451	4355		H0009: 3	
HFCDW50	928120	1032	309 - 569	4356	Pro-62 to Arg-68.	H0009: 3, L0485: 1 and L0604: 1.	
HFCDW82	780025	1033	2 - 268	4357	Phe-10 to Leu-27, Pro-29 to Pro-35.	H0009: 2	
HFCDX12	855385	1034	159 - 287	4358	Asp-37 to Asn-42.	H0009: 2	
HFCDX25	650868	1035	139 - 306	4359	Glu-29 to Ile-35.	H0009: 2 and L0740: 1.	
HFCDX42	573601	1036	42 - 290	4360	Lys-1 to Gly-10, Thr-26 to Cys-55, Gly-58 to Trp-65.	H0009: 2	
HFCDX58	855384	1037	146 - 328	4361		H0009: 2	
HFCDX78	683614	1038	3 - 179	4362		H0009: 2	
HFCDY27	523667	1039	158 - 313	4363		H0009: 3	
HFCEC33	526706	1040	162 - 308	4364	Ser-41 to Gly-47.	H0009: 2	
HFCEE08	926218	1041	173 - 343	4365	Pro-7 to Val-12.	H0009: 4	
HFCEE33	573635	1042	65 - 313	4366		H0009: 2	
HFCEE86	739712	1043	54 - 278	4367		H0009: 4	
HFCEG36	573618	1044	208 - 387	4368		H0009: 2	
HFCEG78	973303	1045	132 - 473	4369	Ser-14 to Ala-19.	H0009: 3	
HFCEH46	526408	1046	42 - 305	4370	Pro-19 to Pro-24, Thr-36 to Asp-47.	H0009: 1 and T0010: 1.	
HFCEH51	974288	1047	372 - 602	4371		H0009: 8	

HFCEH71	573587	1048	3 - 80	4372			H0009: 2		
HFCEI48	573621	1049	94 - 237	4373			H0009: 2		
HFCEI82	573615	1050	11 - 79	4374	Arg-1 to Gln-7.		H0009: 2		
HFCEJ01	917146	1051	78 - 212	4375	Pro-7 to Ile-13.		H0009: 2		
HFCEJ34	855377	1052	16 - 357	4376	Gln-1 to Gln-16, Gln-61 to Asp-72.		H0009: 2		
HFCEJ51	573547	1053	279 - 437	4377	Thr-48 to Tyr-53.		H0009: 2		
HFCEJ62	526656	1054	86 - 322	4378	Asn-1 to Lys-11.		H0009: 3		
HFCEJ63	855376	1055	122 - 364	4379	Ser-23 to Gly-33, Ala-41 to Arg-47, Arg-51 to Arg-56.		H0009: 2		
HFCEJ68	526646	1056	108 - 311	4380	Pro-15 to Gly-25, Pro-39 to Glu-49.		H0009: 2		
HFCEJ73	571352	1057	109 - 249	4381	Thr-1 to Lys-20, Cys-32 to Lys-42.		H0009: 2		
HFCEJ83	781314	1058	1 - 165	4382	Gly-1 to Asp-7, Pro-36 to Gly-46.		H0009: 2		
HFCEK11	967378	1059	98 - 388	4383	Asn-1 to Trp-7.		H0009: 6		
HFCEK41	973278	1060	1 - 231	4384			H0009: 3		
HFCEK75	573541	1061	274 - 420	4385			H0009: 2		
HFCEL22	573542	1062	3 - 224	4386	Gln-1 to Leu-11, Lys-36 to Gly-46.		H0009: 2		
HFCEL32	699450	1063	82 - 279	4387	Gly-46 to Trp-55, Pro-58 to Ile-66.		H0009: 2		
HFCEL80	973276	1064	173 - 307	4388			H0009: 6		
HFCEM15	621618	1065	234 - 344	4389			H0009: 3	6p12	180297, 230450, 263200,

HFCEM17	925379	1066	146 - 268	4390					601690
HFCEM72	721948	1067	1 - 132	4391	Thr-2 to Ala-24.	H0009: 2			
HFCEO16	419086	1068	3 - 398	4392	His-1 to Arg-14, Ser-20 to Arg-27, Ala-52 to Arg-71, Pro-76 to Gly-84.	H0009: 2			
HFCEP11	967369	1069	2 - 160	4393		H0009: 1 and T0010: 1.			
HFCEP62	973300	1070	2 - 298	4394		H0009: 2			
HFCEP64	573553	1071	3 - 110	4395		H0009: 3			
HFCEQ39	573595	1072	126 - 245	4396		H0009: 2			
HFCESS7	974282	1073	380 - 526	4397		H0009: 2			
HFCESS9	739431	1074	3 - 173	4398	Ser-16 to Gly-22.	H0009: 4			
						S0222: 1, H0009: 1 and L0439: 1.	10q23.3-q24	138130, 157640, 174900, 180250, 186770, 203300, 236730, 271245, 278000, 278000, 600095, 600512, 601107, 601130, 601728, 601728, 601728,	

HFCET45	573518	1075	98 - 367	4399				H0009: 2, L0748: 2 and L0439: 1.		601728, 602082
HFCFV63	573938	1076	1 - 216	4400			Pro-15 to Gly-26, Leu-35 to Cys-42, Gly-59 to Gln-67.	H0052: 2, H0009: 2, S0001: 1, L0438: 1 and L0439: 1.		
HFCFB38	707630	1077	176 - 337	4401				H0009: 2 and L0753: 1.		
HFCFC13	855370	1078	1 - 255	4402			Ser-1 to Cys-7, Gln-9 to Gln-19.	H0009: 2		
HFCFC40	526405	1079	156 - 311	4403			Glu-23 to Ile-32.	H0009: 2, H0052: 1, T0010: 1 and L0774: 1.		
HFCFC84	855369	1080	73 - 333	4404			Ser-5 to Ala-12, Gln-15 to His-21, His-79 to Cys-86.	H0009: 3, S0222: 1 and T0010: 1.		
HFCFC88	573499	1081	42 - 218	4405				H0009: 2		
HFCFD65	974285	1082	313 - 468	4406			Ser-1 to Cys-7.	H0009: 3, L0769: 1, L0803: 1, L0438: 1, L0439: 1 and L0777: 1.		
HFCFE05	855371	1083	15 - 206	4407			Ser-41 to Leu-47.	H0009: 2		
HFCFE84	573654	1084	170 - 301	4408			Asn-35 to Thr-40.	H0009: 4		
HFCFF31	778756	1085	131 - 424	4409			Ile-1 to Asn-8, Leu-36 to Asp-64.	L0439: 3, T0010: 2, S0007: 1, H0374: 1, H0009: 1 and S0388: 1.		
HFCFF84	573512	1086	3 - 182	4410			Arg-22 to Pro-28, Gly-31 to Arg-45.	H0009: 2		
HFCFH85	573519	1087	76 - 336	4411			Gln-7 to His-18.	H0009: 2		

HFCFI32	575118	1088	2 - 277	4412	Gly-21 to Gln-28.	H0009: 2		
HFCFI41	855305	1089	37 - 243	4413	Arg-42 to Arg-48.	S0010: 1, H0009: 1, L0803: 1, L0651: 1, L0756: 1 and L0777: 1.		
HFCFL31	881248	1090	147 - 401	4414	Glu-27 to Asp-32, Gln-37 to Lys-44, Ser-53 to His-61.	H0009: 2 and L0700: 1.		
HFCFL94	573497	1091	75 - 344	4415		H0009: 2		
HFCFM18	535352	1092	107 - 280	4416		H0009: 3		
HFCFN03	924747	1093	64 - 384	4417	Ser-12 to Lys-18, Pro-56 to Glu-66.	H0052: 1 and H0009: 1.		
HFCFN62	860191	1094	316 - 513	4418	Glu-12 to Val-19, Ser-50 to Cys-55.	L0794: 2, S0001: 1, H0009: 1, L0744: 1 and L0777: 1.		
HFFAB80	508762	1095	3 - 128	4419	Arg-14 to Pro-21.	S0007: 1 and H0172: 1.		
HFFAD35	531373	1096	41 - 199	4420	Lys-1 to Pro-10, Leu-30 to Lys-38.	H0172: 2		
HFFAD51	704541	1097	2 - 103	4421		H0172: 2		
HFFAD89	531378	1098	3 - 176	4422	Val-8 to Ser-15.	H0172: 2		
HFFAG92	531430	1099	3 - 356	4423	Cys-7 to Arg-13.	H0172: 2		
HFFAH40	855270	1100	3 - 305	4424	Ser-28 to Thr-36, Trp-68 to Arg-73.	H0172: 2		
HFFAJ31	531052	1101	72 - 173	4425		H0172: 2		
HFFAJ42	937630	1102	88 - 141	4426		H0172: 2		
HFFAJ48	531368	1103	33 - 110	4427		H0172: 2		
HFFAJ63	531372	1104	1 - 189	4428		H0172: 2		
HFFAV38	571301	1105	1 - 111	4429	Trp-11 to Trp-19.	H0172: 2		
HFFAW38	531366	1106	1 - 165	4430		H0172: 2		

HFGAD96	921811	1107	2 - 160	4431	Ser-4 to Lys-9.	H0178: 2 and S0007: 1.		
HFGAG18	955743	1108	383 - 153	4432	Gln-1 to Gln-8.	L0521: 4, S6026: 1, S0300: 1, H0178: 1, L0439: 1, L0745: 1 and L0756: 1.		
HFGAI53	524897	1109	45 - 233	4433	Thr-31 to Thr-38.	H0178: 2		
HFGAK06	932785	1110	310 - 579	4434	Lys-1 to Gln-13, Gln-23 to Leu-28.	L0439: 6, L0351: 5, L0438: 4, S0007: 3, H0178: 3, T0010: 3, L0769: 3, H0009: 2, L0770: 2, S0001: 1, L0638: 1, L0639: 1, L0789: 1, L0791: 1, H0547: 1, L0746: 1 and L0756: 1.	2p11.2	178640, 216900
HFGAK43	971449	1111	9 - 191	4435	Thr-9 to Thr-14.	H0178: 2		
HFGAL55	524498	1112	59 - 295	4436	Ser-17 to Ala-36.	H0178: 2, S0222: 1, S6014: 1, S0049: 1 and H0052: 1.		
HFGAN33	524893	1113	41 - 151	4437		H0178: 2		
HFGMD05	932769	1114	437 - 688	4438	Phe-17 to Lys-22.	L0438: 2, L0442: 1, S0001: 1, H0178: 1, L0770: 1, L0439: 1, L0740: 1 and L0594: 1.		
HFPAC31	927895	1115	696 - 971	4439	Ser-3 to Lys-8, Val-12 to Cys-18.	S6016: 1 and S0346: 1.		
HFPAC49	578728	1116	34 - 225	4440		S6016: 2 and L0779: 1.		
HFPAF84	783117	1117	107 - 220	4441		S6016: 2		

HFPAP90	572436	1118	1 - 480	4442			L0769: 3, S0282: 1, S6016: 1 and H0327: 1.		
HFPAP069	946898	1119	327 - 521	4443			L0439: 4, S0010: 3, L0438: 2, S0001: 1, S6016: 1 and T0010: 1.		
HFPAP14	658425	1120	197 - 325	4444		Glu-12 to Ser-20, Leu-30 to Gln-35.	S6016: 2		
HFPBA90	893690	1121	413 - 664	4445		Arg-9 to Ile-15, Cys-24 to Met-29, Glu-75 to Ser-80.	L0005: 2, S0222: 2, L0157: 2, L0775: 2, L0439: 2, S6026: 1, L0438: 1 and L0592: 1.		
HFPBB04	766597	1122	252 - 401	4446		Lys-44 to Asp-50.	L0439: 2, S0222: 1 and H0438: 1.		
HFPBD64	974971	1123	104 - 379	4447		Gly-5 to Pro-11, Arg-36 to Val-52.	H0261: 2 and S0222: 1.		
HFPBE35	881657	1124	1 - 240	4448		Pro-9 to Gln-14.	S0222: 1 and S6028: 1.		
HFPBF22	674529	1125	146 - 343	4449		Arg-10 to Ala-18.	S0222: 1 and S0021: 1.		
HFPBF42	713754	1126	202 - 396	4450		Glu-18 to His-24.	S0222: 2		
HFPBG94	949768	1127	98 - 247	4451			S0222: 2		
HFPBI67	741753	1128	3 - 221	4452		Ala-29 to Asn-34, Ser-49 to Arg-54, Gln-62 to Gln-67.	S0222: 1 and S0260: 1.		
HFPBK79	529705	1129	305 - 562	4453		Asn-27 to Leu-34, Asn-36 to Lys-45.	L0439: 17, L0438: 4, H0052: 2, S0300: 1, S0222: 1, S0005: 1, L0163: 1, L0791: 1, L0779: 1 and L0758: 1.	1q42.1-q43	106150, 106150, 136850, 156570, 214500, 600996,

										601975, 602759
HFPBL41	772836	1130	354 - 608	4454					L0539: 2, S0222: 2, L0534: 1 and L0748: 1.	
HFPBM53	728204	1131	1 - 210	4455		Ala-2 to Arg-10.			S0222: 2	
HFPBN23	675854	1132	291 - 536	4456		Ser-7 to Ser-20, Lys-27 to Lys-33.			S0222: 2	
HFPBN85	792093	1133	403 - 522	4457		Leu-5 to Pro-12.			L0605: 4, L0439: 3, S0300: 1, S0222: 1, L0740: 1 and L0747: 1.	
HFPBQ17	663771	1134	76 - 399	4458		Lys-1 to Ala-8.			S0222: 1 and H0052: 1.	
HFPBR10	964554	1135	3 - 284	4459		Ala-9 to Thr-14, Pro-16 to Thr-27, Pro-79 to Cys-85, Glu-88 to Arg-94.			L0439: 5, L0157: 2, L0794: 2, L0005: 1, S0300: 1, S0222: 1, H0052: 1, T0010: 1, S0112: 1, L0805: 1, L0779: 1 and L0593: 1.	
HFPBS22	674522	1136	70 - 372	4460		Lys-55 to Tyr-63.			S0222: 2	
HFPBS62	744282	1137	34 - 174	4461		Leu-19 to Leu-27.			S0222: 2	
HFPBS96	780105	1138	1 - 372	4462		Arg-1 to Gln-13, Thr-21 to Gln-26, Pro-51 to Arg-58, Ala-61 to Tyr-69, Ser-78 to Thr-85.			S0222: 1 and S0050: 1.	
HFPBV91	789426	1139	134 - 307	4463		Ser-19 to Ala-26, His-31 to Gln-39.			S0222: 1 and S6028: 1.	162400, 602014, 602088
HFPBX13	923802	1140	296 - 490	4464		Gly-1 to Pro-8,			L0742: 5, L0439: 4,	

					Ser-10 to Cys-16, Pro-18 to Ser-28, Leu-38 to Asp-44.	L0759: 2, S6024: 1, S0222: 1, L0764: 1, L0766: 1, L0805: 1, L0776: 1 and L0758: 1.			
HFPBY50	724330	1141	2 - 127	4465		S0222: 2			
HFPCA08	959353	1142	12 - 242	4466	Thr-16 to Glu-27, Pro-54 to His-64.	S0222: 2			
HFPCB06	950223	1143	312 - 130	4467	Ser-16 to Tyr-24.	L0756: 4, S0412: 2, S0222: 1, H0327: 1, H0009: 1, L0157: 1 and S0031: 1.			
HFPCCK53	708484	1144	223 - 462	4468	Thr-19 to Phe-24, Leu-28 to His-35.	L0803: 2, L0588: 2, S0222: 1, S0051: 1, T0010: 1, L0769: 1 and L0766: 1.			
HFPCCL18	666390	1145	159 - 410	4469	Glu-1 to Ser-8.	S0222: 1, S6028: 1, L0769: 1, L0796: 1, L0438: 1, L0741: 1, L0439: 1 and L0747: 1.			
HFPCCL44	716579	1146	2 - 229	4470	Gly-19 to Trp-26, Leu-42 to Trp-52, Pro-61 to Thr-75.	S0222: 2, S0010: 1, S0346: 1, L0438: 1 and L0439: 1.			
HFPCS02	919998	1147	2 - 385	4471		S0222: 2			
HFPCS09	925485	1148	279 - 635	4472	Ser-58 to Gly-71, Pro-76 to His-83, Pro-89 to Trp-107.	AR089: 28, AR061: 18 L0439: 5, S0222: 4, S0010: 4, H0052: 4, L0455: 4, H0009: 2, L0438: 2, H0333: 1, T0082: 1, H0194: 1,			

									S0388: 1, S6028: 1, T0006: 1, L0741: 1 and L0759: 1.			
HFPCS13	916418	1149	223 - 318	4473					S0222: 2			
HFPCS49	921788	1150	2 - 112	4474					S0222: 1 and T0082: 1.			
HFPCCT39	694509	1151	2 - 211	4475				Met-7 to Ala-13, Met-32 to Gln-39, Glu-46 to Gln-59.	S0222: 2 and L0520: 1.			
HFPCCT65	965540	1152	19 - 231	4476				Gln-17 to Lys-27, Thr-40 to Gly-46, Pro-64 to Gly-71.	S0222: 2			
HFPCV25	784747	1153	224 - 394	4477					S0222: 1, S0388: 1 and L0803: 1.			
HFPCX74	848926	1154	421 - 822	4478				Ser-9 to Arg-14, Glu-39 to Leu-44, Gly-83 to Leu-105.	L0758: 2, S0222: 1, S0010: 1 and L0594: 1.			
HFPCY73	670529	1155	37 - 294	4479				Gln-8 to Cys-22, Glu-26 to Gly-31, Ala-38 to Asn-50, Gln-57 to His-68, Gln-74 to Trp-79.	S0222: 2, L0483: 2 and L0749: 2.			
HFPCY77	670100	1156	53 - 244	4480				Asn-15 to Cys-22, Gly-43 to Thr-50.	S0222: 1 and H0052: 1.			
HFPCZ23	675859	1157	73 - 315	4481				Arg-1 to Arg-8, Ile-13 to Met-18.	L0809: 2, S0222: 1, L0157: 1, S0051: 1, L0769: 1, L0764: 1, L0794: 1, L0792: 1, L0439: 1 and L0366: 1.	17p11.2	100710, 182290, 201475, 270200, 601097, 601097,	

												601097, 602666
HFPDD23	675277	1158	229 - 345	4482		Tyr-1 to Gly-12, Gln-20 to Ser-29.		S0222: 1 and H0052: 1.				
HFPDE02	920020	1159	476 - 754	4483		Asp-1 to Ala-23, His-68 to Cys-76.		L0439: 5, S0222: 2, L0438: 2, S6024: 1, L0769: 1, L0772: 1, L0386: 1 and L0659: 1.				
HFPDGS6	733103	1160	121 - 276	4484		Ser-32 to Leu-39.		S0222: 2				
HFPDL35	668156	1161	108 - 332	4485				S0222: 1 and S0386: 1.				
HFPDQ59	722278	1162	66 - 278	4486		Val-10 to Asn-17, His-40 to His-48, Asn-52 to Val-61.		S0001: 1 and S0222: 1.				
HFPDX80	775445	1163	2 - 205	4487		Ser-1 to Lys-9, Phe-38 to Ser-43, Phe-49 to Ser-64.		S0222: 2				
HFPEC15	952891	1164	3 - 677	4488		Ser-3 to Gln-12, Arg-63 to Ser-71, Asp-87 to Leu-97, Tyr-129 to Pro-136, Lys-141 to Leu-151, Pro-170 to Thr-176.		L0747: 2, S6024: 1, S0222: 1, L0803: 1 and L0805: 1.				
HFPBH73	727955	1165	1 - 135	4489				S0222: 2				
HFPEI45	717120	1166	2 - 331	4490				S0222: 2, L0773: 1, L0776: 1 and L0791: 1.				
HFPEL71	735189	1167	169 - 86	4491				S0222: 1 and T0010: 1.				
HFPEO38	709042	1168	223 - 366	4492		Arg-28 to Trp-33.		S0222: 1 and S0010: 1.				
HFPEO92	953098	1169	1 - 129	4493				S0222: 2				

HFPEQ63	940247	1170	517 - 272	4494	Lys-1 to Leu-20, Thr-38 to Arg-44, Arg-51 to Gln-60, Gln-74 to Lys-82.	L0439: 6, L0438: 2, S0222: 1, S0010: 1, H0194: 1, L0455: 1 and S0036: 1.		
HFPEV01	915847	1171	274 - 453	4495	Arg-30 to Gly-36, Arg-38 to Ser-51.	S0222: 3, L0371: 1 and L0749: 1.		
HFPEV57	734467	1172	198 - 347	4496	Ile-10 to Gln-18, Asn-39 to Glu-50.	L0756: 5, S0222: 1 and S0038: 1.		
HFPEV75	765257	1173	2 - 169	4497	Arg-17 to Leu-33.	S0222: 2		
HFPPD78	975305	1174	2 - 226	4498	Pro-7 to Gly-15, Ser-32 to Leu-38, Lys-47 to Pro-52, Pro-60 to Gln-66.	S0001: 1 and S0222: 1.		
HFPEI54	968941	1175	71 - 274	4499	Asn-48 to Arg-53.	S0222: 3, L0751: 3, L0157: 1, L0803: 1 and L0608: 1.		
HFPEO70	927428	1176	292 - 408	4500		S0222: 2		
HFPPQ63	914618	1177	203 - 394	4501		S0222: 2		
HFPPF30	917993	1178	1 - 288	4502	Gln-22 to Arg-31, Ala-61 to Pro-85.	S0222: 2		
HFPPFZ35	966749	1179	3 - 299	4503	Pro-25 to Cys-51, Gly-59 to Ser-69, Ala-74 to Ala-80.	S0222: 1 and S06028: 1.		
HFPGD04	926310	1180	82 - 228	4504	Thr-12 to Val-17.	S0222: 2		
HFPGD43	872002	1181	3 - 275	4505	Met-9 to Cys-18, Ser-35 to Asp-42.	S0222: 2		
HFPGE35	969418	1182	75 - 773	4506	Ala-13 to Gly-22, Ala-25 to Lys-35.	S0222: 2		

HFPGF71	888879	1183	3 - 368	4507	Ser-41 to Arg-48. Ala-6 to Asp-11, Pro-59 to Arg-69.	S0222: 2		
HFPGG04	926309	1184	1 - 138	4508	Gly-1 to Glu-9.	S0222: 2		
HFPGH12	969426	1185	165 - 281	4509		S0222: 2		
HFPGL08	957903	1186	225 - 392	4510		S0222: 2		
HFPGN12	969436	1187	173 - 412	4511		S0222: 2		
HFPGV81	951957	1188	50 - 322	4512		S0222: 2		
HFPGW08	957898	1189	1 - 171	4513	His-16 to Gly-22, Arg-45 to Pro-55.	S0222: 2		
HFPGW74	968020	1190	2 - 142	4514	Gly-5 to Phe-11, Asp-39 to Ser-47.	S0222: 1, S0220: 1 and H0052: 1.		
HFPGZ66	974382	1191	1 - 177	4515	Pro-36 to Lys-51.	S0222: 2		
HFPHG06	933802	1192	2 - 265	4516		AR089: 0, AR061: 0 S0222: 2		
HFPHI62	934529	1193	3 - 410	4517	Met-1 to Gln-6, Pro-38 to Asn-60.	AR061: 226, AR089: 79 L0439: 8, H0052: 7, L0741: 7, L0756: 4, S0010: 3, H0261: 2, H0156: 2, S0049: 2, L0770: 2, L0776: 2, L0742: 2, L0745: 2, L0366: 2, S0222: 1, H0438: 1, H0390: 1, S0346: 1, H0009: 1, L0455: 1, S0038: 1, L0789: 1 and L0758: 1.		

HFPHI76	878303	1194	3 - 368	4518			S0222: 3		
HFPHS77	944280	1195	313 - 957	4519	Ile-47 to Cys-55, Trp-104 to Asp-111.		AR089: 7, AR061: 7 S0222: 1, H0052: 1, L0766: 1 and L0779: 1.		
HFPHU02	917987	1196	38 - 181	4520			S0222: 2		
HFPHW01	914622	1197	116 - 298	4521			S0222: 1 and H0052: 1.		
HFPIE03	922558	1198	77 - 241	4522			H0052: 2, S0222: 1 and L0438: 1.		
HFPIM12	965522	1199	2 - 103	4523			S0222: 2		
HFPIP01	914630	1200	3 - 539	4524	Glu-5 to Lys-20, Lys-25 to Lys-35, Lys-42 to Asn-47, Thr-62 to Thr-67, Leu-82 to Gln-101, Tyr-107 to Glu-115, Asn-123 to Arg-129, Lys-135 to Glu-142.		S0222: 1 and S0260: 1.		
HFPJA11	965516	1201	136 - 246	4525			S0222: 2		
HFPJJ15	953625	1202	150 - 257	4526			S0222: 1 and S0031: 1.		
HFPJM13	872004	1203	66 - 299	4527	Gly-1 to Val-8.		S0222: 2		
HFPJU03	922534	1204	43 - 243	4528	Asp-34 to Ser-42.		S0222: 2		
HFPJY01	945203	1205	64 - 426	4529	Ile-7 to Gln-14, Pro-17 to Gly-41, Trp-58 to Leu-63.		L0766: 5, S0222: 4, L0439: 3, L0759: 3, H0052: 2, L0768: 2, L0742: 2, S6024: 1, L0534: 1, S0049: 1, S0051: 1, S0038: 1, L0351: 1, L0763: 1 and		

HFPKE09	921503	1206	358 - 636	4530	Thr-35 to Pro-43, Pro-60 to Ser-68, Ser-72 to Arg-77.	L0776: 1. S0007: 1, S0222: 1, H0178: 1, S0388: 1 and L0779: 1.		
HFPKE10	961915	1207	9 - 218	4531		S0222: 2		
HFRAB74	728462	1208	252 - 401	4532	Ser-16 to Thr-21.	S0035: 1 and S0050: 1.		
HFRAF23	676364	1209	33 - 143	4533		S0050: 2		
HFRAF66	927216	1210	256 - 624	4534	Arg-5 to Asp-11, Gly-20 to Pro-29, Glu-37 to Leu-45, Glu-52 to Gly-66, Ser-88 to Glu-93, Leu-105 to Asp-123.	S0282: 1, S0010: 1, S0050: 1, L0794: 1, L0741: 1, L0747: 1 and S0106: 1.		
HFRAJ66	974470	1211	3 - 281	4535		S6016: 1 and S0050: 1.		
HFRAO93	757471	1212	154 - 339	4536		S0050: 2		
HFRAP76	527844	1213	46 - 210	4537	Ile-7 to Gly-15.	S0050: 2		
HFRAQ07	954089	1214	1 - 150	4538		S0050: 2		
HFRAQ70	527663	1215	148 - 315	4539		S0050: 2		
HFRAU42	839092	1216	134 - 328	4540	Ser-4 to Tyr-9.	S0050: 2		
HFRAU67	527839	1217	112 - 255	4541	Glu-20 to Tyr-25.	S0050: 2		
HFRAU78	827374	1218	1 - 210	4542	Gln-36 to Ser-47.	S0050: 2		
HFRAV44	572406	1219	3 - 254	4543		S0050: 1 and S0031: 1.		
HFRBD01	921595	1220	42 - 146	4544	Leu-1 to Lys-21.	S0050: 2		
HFRBD18	527661	1221	85 - 195	4545		S0050: 2		
HFRBD55	735061	1222	226 - 390	4546		S0050: 2, S0300: 1 and L0439: 1.		
HFRBD73	968382	1223	1 - 441	4547	Arg-11 to Arg-18.	S0050: 2		
HFRBE38	521887	1224	219 - 374	4548		S0050: 2		

HFRBK08	960107	1225	3 - 341	4549			S0050: 2		
HFRBK36	524762	1226	49 - 222	4550	Lys-1 to His-21.		S0050: 2		
HFRBL01	859921	1227	219 - 34	4551	Arg-7 to Asn-22, Leu-28 to Gly-35, Gly-55 to Arg-60.		S0050: 2		
HFRBL10	926375	1228	513 - 166	4552			L0439: 2, S0222: 1, S0050: 1 and L0438: 1.		
HFRBL11	967676	1229	71 - 325	4553	Ser-3 to Gly-27.		S0050: 3		
HFRBL90	967711	1230	88 - 231	4554			S0050: 2 and S0051: 1.		
HFRBM79	839091	1231	102 - 404	4555	Asn-35 to Pro-44, Thr-56 to Gly-63.		S0050: 2		
HFRBN32	927584	1232	69 - 230	4556			S0050: 2		
HFRBN35	574853	1233	1 - 198	4557	Asn-11 to Leu-17, Pro-19 to Thr-25.		S0050: 2		
HFRBN59	739539	1234	77 - 232	4558	Gln-9 to Ser-15.		AR089: 2, AR061: 1 S0050: 1 and S0260: 1.		
HFRBO82	527606	1235	112 - 243	4559			S0050: 2		
HFRBR13	921579	1236	3 - 155	4560			S0050: 2		
HFRBS38	967678	1237	86 - 388	4561	Leu-21 to Ile-26.		S0001: 1 and S0050: 1.		
HFRBU83	781406	1238	191 - 388	4562			S0050: 2		
HFRBY31	574842	1239	2 - 133	4563	Ala-1 to Gln-8.		S0050: 2		
HFRCB20	960108	1240	131 - 343	4564			S0050: 2		
HFRCG75	574894	1241	123 - 290	4565	His-8 to Ala-17, His-26 to Ala-32.		S0222: 1, S0050: 1 and S0051: 1.		
HFTAA81	509440	1242	2 - 100	4566			H0123: 3		
HFTAB12	971501	1243	142 - 375	4567			H0123: 2 and L0759: 1.		
HFTAB56	733744	1244	154 - 50	4568	Leu-13 to Glu-26.		H0123: 2		

HFTAB60	967712	1245	90 - 377	4569	Ala-7 to Arg-12.	H0123: 2, L0783: 1 and L0665: 1.		
HFTAB62	525623	1246	144 - 368	4570	Pro-5 to Pro-12.	H0123: 2, L0747: 1 and L0756: 1.		
HFTAE25	525620	1247	43 - 282	4571		H0123: 2		
HFTBI47	720612	1248	90 - 230	4572		S0222: 1 and H0123: 1.		
HFTBJ74	524358	1249	3 - 122	4573	Gly-18 to Asn-23.	H0123: 2		
HFTBT57	917997	1250	128 - 268	4574	Lys-9 to Ile-21.	S0222: 1 and H0123: 1.		
HFTCX91	529952	1251	1 - 219	4575	Gly-1 to Gly-7, Pro-9 to Pro-14, Ser-16 to Arg-21.	S0010: 1, H0123: 1 and S0051: 1.		
HFTDC19	578937	1252	42 - 263	4576		H0123: 2 and L0779: 1.		
HFTDF15	657020	1253	129 - 254	4577		AR089: 3, AR061: 2 H0563: 1 and H0123: 1.		
HFTDP81	578933	1254	1 - 207	4578	Glu-1 to Tyr-8.	H0123: 2		
HFXAA32	709050	1255	1 - 246	4579		S0001: 3		
HFXAF16	667694	1256	2 - 202	4580		S0001: 2		
HFXAF37	708440	1257	21 - 179	4581	Glu-15 to Ser-21.	S0001: 2		
HFXAK28	530313	1258	177 - 347	4582	Leu-22 to Gly-27, Gln-41 to Trp-46.	S0001: 2		
HFXAK58	738429	1259	52 - 192	4583	Asp-1 to Asn-6, Gln-9 to Tyr-21, Trp-30 to Ala-36.	S0001: 1 and S0282: 1.		
HFXAK62	970695	1260	164 - 283	4584	Lys-20 to Thr-28.	S0001: 2		
HFXAM22	678574	1261	33 - 146	4585		S0001: 2		
HFXAM38	974236	1262	10 - 339	4586	Arg-1 to Leu-6,	S0001: 1 and H0194: 1.		

HFAXO25	572521	1263	117 - 242	4587	Arg-10 to Gly-19.				
HFAXO30	530308	1264	56 - 199	4588	Ser-6 to Asn-17.	S0001: 2			
HFAXU70	880736	1265	100 - 237	4589		S0001: 2			
HFAXV16	854524	1266	152 - 400	4590	Arg-12 to Ser-18, Ile-67 to Gly-82.	S0001: 2			
						S0001: 1, S0222: 1, L0748: 1 and L0749: 1.	7q11.23	116860, 129900, 233700, 600079	
HFXXBA68	506708	1267	65 - 325	4591	Pro-26 to Val-33, Arg-52 to Ser-58.	S0001: 2			
HFXXBB69	757769	1268	3 - 113	4592		S0001: 2			
HFXXBC10	871978	1269	2 - 244	4593	Glu-62 to His-68.	S0001: 1, H0438: 1 and H0009: 1.			
HFXXBC19	574576	1270	210 - 488	4594		S0001: 2			
HFXXBC74	506709	1271	2 - 283	4595	Tyr-7 to Ser-12, Arg-31 to Tyr-39.	S0001: 2			
HFXXBE35	707109	1272	44 - 304	4596	Thr-8 to Val-15, Glu-31 to His-39, Gln-45 to Pro-50.	S0001: 2			
HFXXBF35	574580	1273	11 - 199	4597	Gln-41 to Ser-46.	S0001: 2			
HFXXBG07	953907	1274	260 - 60	4598	Lys-1 to Arg-19.	S0001: 2			
HFXXBG30	947927	1275	3 - 290	4599		S0001: 1 and S0049: 1.			
HFXXBG79	574507	1276	154 - 324	4600	Arg-12 to Gly-19.	S0001: 2			
HFXXBH78	685628	1277	230 - 340	4601		S0001: 2			
HFXXBI10	968261	1278	90 - 191	4602		S0001: 2			
HFXXBJ91	506707	1279	20 - 205	4603	Pro-34 to Phe-40.	S0001: 1 and H0392: 1.			
HFXXBK17	574574	1280	285 - 389	4604		S0001: 2			
HFXXBL65	751534	1281	116 - 268	4605	Pro-23 to Gln-31.	S0001: 1 and S0260: 1.			

HFXBM32	573428	1282	1 - 96	4606	Thr-2 to Ser-13, Lys-18 to Tyr-32.	S0001: 2		
HFXBN28	573080	1283	111 - 359	4607	Arg-1 to Arg-6, Pro-9 to Gly-15.	S0001: 2		
HFXBP13	660917	1284	98 - 268	4608	Lys-3 to Glu-8, Pro-22 to Gln-27.	S0001: 2		
HFXBP50	574571	1285	3 - 215	4609		S0001: 2		
HFXBP68	974931	1286	119 - 316	4610	Ser-29 to Gln-40, Pro-49 to Ser-54.	S0001: 3		
HFXBP83	772896	1287	1 - 213	4611		S0001: 1 and S0282: 1.		
HFXBR20	574501	1288	30 - 215	4612	Leu-2 to Lys-7, Phe-20 to Gly-25, Ser-54 to Ile-59.	S0001: 2		
HFXBR71	760527	1289	3 - 269	4613	Ser-1 to Ala-17, Ala-29 to Ala-35, Asp-42 to Pro-47.	S0001: 1 and S0031: 1.		
HFXBR77	784018	1290	98 - 340	4614	Thr-26 to Gly-34, Pro-37 to Gly-50, Lys-59 to Ala-67, Lys-70 to Gln-77.	S0001: 1, S0222: 1 and 5p15.3 S0038: 1.	602568	
HFXBS65	574572	1291	120 - 308	4615	Arg-6 to Lys-11.	S0001: 2		
HFXBU22	574506	1292	232 - 414	4616		S0001: 2		
HFXBV26	959971	1293	196 - 324	4617	Val-7 to His-13, Ser-19 to Gly-24.	S0001: 2		
HFXBV57	534728	1294	197 - 349	4618		S0001: 1, H0261: 1, H0052: 1 and H0194: 1.		
HFXBW05	932417	1295	10 - 318	4619	Gly-35 to Gly-41.	S0001: 2		
HFXBY19	953892	1296	2 - 199	4620		S0001: 2		

HFXCA51	530311	1297	192 - 386	4621	Thr-5 to Asp-10, Arg-18 to Thr-26, Gly-36 to Leu-44.	S0001: 2		
HFXCB15	660575	1298	1 - 279	4622	Arg-3 to Gly-30, Cys-63 to Trp-73...	S0001: 2		
HFXCB46	533549	1299	220 - 348	4623		S0001: 2		
HFXCB53	574495	1300	252 - 431	4624		S0001: 2		
HFXCE58	574490	1301	97 - 309	4625	Ser-19 to Gln-29, Ser-46 to Ser-51.	S0001: 2, L0776: 1 and L0745: 1.		
HFXCF48	579070	1302	2 - 256	4626		S0001: 2		
HFXCF70	974367	1303	194 - 406	4627		S0001: 3 and S0282: 1.		
HFXCG04	925572	1304	1 - 144	4628		S0001: 2		
HFXCI82	932419	1305	58 - 228	4629	Leu-21 to Met-30, Lys-41 to Trp-47.	S0001: 2		
HFXCJ89	574483	1306	3 - 74	4630		S0001: 2		
HFXCL36	530221	1307	2 - 109	4631	Ser-13 to Arg-24.	S0001: 2		
HFXCM46	558935	1308	127 - 351	4632	Ser-6 to Arg-15, Arg-40 to Trp-59.	H0052: 2, S0001: 1 and L0780: 1.		
HFXCS47	573438	1309	142 - 357	4633		S0001: 2		
HFXCS77	728904	1310	154 - 387	4634		S0001: 3		
HFXCT60	740519	1311	2 - 184	4635	Glu-9 to Ala-26.	S0001: 2		
HFXDA19	579083	1312	63 - 302	4636	Met-32 to Lys-46.	S0001: 3		
HFXDC22	579071	1313	1 - 243	4637	Gly-2 to Pro-7, Arg-17 to Lys-25, Arg-35 to Arg-44, Ser-54 to Gly-61.	S0001: 2		
HFXDF19	591922	1314	1 - 432	4638	Gln-22 to Tyr-29, Ser-56 to Gln-62,	AR089: 184, AR061: 53	2p23	143450, 182601,

					Glu-84 to Leu-89, Leu-91 to Glu-96.		S0001: 1 and S0038: 1.		264600, 278300, 600890, 600890, 601071, 602134
HFXDF52	578813	1315	3 - 296	4639	Phe-1 to His-15, Cys-54 to Ser-61.		S0001: 1 and S0031: 1.		
HFXDF58	871547	1316	206 - 391	4640	Asn-1 to Cys-16, Met-34 to Trp-41.		S0001: 1, S0282: 1, L0534: 1 and L0142: 1.		
HFXDG17	578850	1317	2 - 142	4641	Ile-34 to Gly-39.		S0001: 2		
HFXDG21	578790	1318	247 - 411	4642			S0001: 2		
HFXDH15	660492	1319	176 - 349	4643	Arg-7 to Ser-12, Gly-34 to Ser-42.		S0001: 3		
HFXDH33	702583	1320	206 - 364	4644	Thr-39 to Ser-44.		S0001: 1 and S0386: 1.		
HFXDH49	723093	1321	128 - 421	4645			S0001: 1 and S0038: 1.		
HFXDH89	711193	1322	110 - 307	4646	Asn-31 to Glu-36, Thr-44 to Gln-53.		S0001: 2		
HFXDI77	767645	1323	1 - 231	4647			S0001: 1 and S0036: 1.		
HFXDK31	506570	1324	37 - 183	4648	Thr-8 to Ile-15.		S0001: 2		
HFXDK58	871553	1325	22 - 294	4649			S0001: 2		
HFXDK76	572820	1326	25 - 252	4650	Met-1 to His-6.		S0001: 2		
HFXDL11	967301	1327	1 - 201	4651	Ile-1 to Lys-6.		S0001: 2		
HFXDL12	971181	1328	335 - 3	4652	Phe-1 to Pro-10, Lys-33 to Asn-38.		L0439: 6, S0001: 1, H0392: 1, L0157: 1, L0647: 1, L0438: 1, L0592: 1 and L0594: 1.		
HFXDL23	573077	1329	1 - 159	4653	Thr-12 to His-29,		S0001: 2		

HFxDL89	572822	1330	56 - 274	4654	Arg-32 to Pro-40. Asn-10 to Glu-16, Lys-29 to Gly-35, Ser-58 to Arg-72.	S0001: 2		
HFxDM92	573073	1331	49 - 222	4655		S0001: 2		
HFxDN79	578870	1332	3 - 194	4656	Pro-12 to Gln-19.	S0001: 2		
HFxD070	579078	1333	2 - 142	4657	Phe-19 to Gln-26.	S0001: 2		
HFxD083	578847	1334	16 - 207	4658	Arg-1 to Cys-10.	AR089: 1, AR061: 1 S0001: 3		
HFxDP36	575693	1335	249 - 539	4659	Arg-15 to Asp-20, Ile-54 to Pro-61.	S0001: 2		
HFxDP40	578867	1336	2 - 121	4660		S0001: 2		
HFxDQ05	932172	1337	65 - 214	4661		S0001: 2		
HFxDQ55	722990	1338	59 - 247	4662	Gln-3 to His-18, Pro-21 to Leu-29, Gln-44 to Ser-53.	S0001: 2		
HFxDQ95	578853	1339	97 - 333	4663	His-7 to Gln-20.	S0001: 2		
HFxD51	725776	1340	150 - 347	4664	Gln-34 to Val-41, Ser-51 to Gly-62.	S0001: 1 and S0282: 1.		
HFxD503	924674	1341	2 - 166	4665		S0001: 2		
HFxD572	578842	1342	251 - 406	4666		S0001: 2		
HFxD63	710429	1343	104 - 355	4667		S0001: 2		
HFxD69	578821	1344	146 - 277	4668		S0001: 2		
HFxDU03	925732	1345	1 - 198	4669	Arg-36 to Ser-46.	S0001: 2		
HFxDU32	506503	1346	44 - 256	4670		S0001: 2		
HFxDW30	578778	1347	2 - 286	4671	Pro-12 to Trp-17.	S0001: 2		
HFxDW84	578769	1348	57 - 278	4672	Leu-25 to Trp-40, Asp-68 to Arg-74.	S0001: 2		

HFXDX01	916949	1349	90 - 356	4673	Asn-33 to Pro-42, Pro-45 to Lys-50, Pro-52 to Pro-66.	S0001: 2	
HFXDX36	578841	1350	165 - 326	4674	Trp-35 to Cys-41.	S0001: 2	
HFXDY05	928133	1351	79 - 198	4675	Gly-13 to Phe-24.	S0001: 2	
HFXEA50	575909	1352	1 - 147	4676	Gly-1 to Asn-13.	S0001: 3	
HFXEA63	745201	1353	161 - 298	4677	Asp-13 to Lys-20.	S0001: 1 and S0282: 1.	
HFXEA80	508263	1354	3 - 251	4678	Thr-6 to Arg-12.	H0052: 2 and S0001: 1.22q13.33	
HFXEB56	579084	1355	305 - 180	4679		S0001: 2 and L0748: 1.	
HFXED56	578775	1356	10 - 171	4680		S0001: 2	
HFXED57	578945	1357	2 - 88	4681	Gln-11 to Ala-16.	S0001: 1 and S0036: 1.	
HFXEP11	967080	1358	21 - 164	4682	Ser-12 to Lys-22, Gln-25 to Arg-31.	S0001: 2	
HFXEP44	496203	1359	104 - 259	4683		S0001: 2	
HFXEP57	854444	1360	117 - 326	4684	Thr-14 to Phe-21.	S0001: 2	
HFXEP63	725767	1361	73 - 441	4685	Gly-41 to Gly-49, Lys-62 to Asp-67, Thr-84 to Lys-92.	S0001: 1 and S0031: 1.	
HFXEP65	750258	1362	208 - 318	4686	Glu-1 to Gln-11, Ser-13 to Pro-23.	S0001: 2	
HFXEP67	751212	1363	8 - 139	4687	Glu-9 to Phe-14.	S0001: 2 and S0346: 1.	
HFXET33	702444	1364	1 - 93	4688		S0001: 2	
HFXET75	764438	1365	3 - 86	4689	His-1 to Gln-6.	S0001: 2	
HFXET79	774046	1366	18 - 263	4690	Pro-3 to Asn-11, Thr-66 to Lys-71.	S0001: 2	
HFXET96	796397	1367	3 - 515	4691	Lys-5 to Arg-11, Ser-24 to Gly-32.	S0001: 3	
HFXFG42	713037	1368	3 - 152	4692		S0001: 2	

HFXXFG77	881548	1369	103 - 411	4693	Asn-72 to Ser-89.	S0001: 2	
HFXXFG85	694366	1370	2 - 382	4694	Pro-73 to Glu-78, Glu-80 to Arg-90.	S0001: 2	
HFXXFH27	670931	1371	155 - 301	4695	Ala-28 to Lys-37.	S0001: 2	
HFXXFH34	496219	1372	112 - 381	4696		S0001: 4	
HFXXFH53	728257	1373	2 - 202	4697		S0001: 2	
HFXXFH95	793209	1374	3 - 101	4698		S0001: 2	
HFXXFI16	691722	1375	189 - 380	4699	Phe-9 to Asn-16.	S0001: 1 and S0222: 1.	
HFXXFI21	670947	1376	1 - 138	4700	Ser-38 to Cys-44.	S0001: 2	
HFXXFI77	772211	1377	49 - 243	4701	Gly-36 to Asn-44.	S0001: 2	
HFXXFZ18	854438	1378	21 - 308	4702		S0001: 2	
HFXXGC26	854437	1379	30 - 200	4703	His-1 to Asn-6.	S0001: 2	
HFXXGC70	757197	1380	24 - 155	4704	Pro-17 to Arg-23.	S0001: 4	
HFXXGE35	707116	1381	92 - 229	4705		S0001: 2	
HFXXGE38	708445	1382	3 - 134	4706	Pro-33 to Ser-38.	S0001: 2	
HFXXGE58	836486	1383	3 - 368	4707	Lys-35 to His-42, Thr-66 to Ser-76, Arg-105 to Asn-111.	AR089: 4, AR061: 3 S0001: 2	
HFXXGI35	707117	1384	1 - 195	4708	Arg-31 to Thr-37.	S0001: 3	
HFXXGI41	496181	1385	115 - 342	4709		S0001: 2	
HFXXGI82	780329	1386	1 - 225	4710		S0001: 2	
HFXXGR53	916512	1387	1 - 276	4711	Ser-15 to Arg-23, Pro-25 to Gly-35, Gln-52 to Phe-58.	S0001: 2	
HFXXGS21	670942	1388	58 - 171	4712	Ser-20 to Asn-27.	S0001: 2	
HFXXGS31	698034	1389	1 - 297	4713	Arg-1 to Thr-8, Pro-16 to Tyr-23.	S0001: 2	
HFXXGU32	699274	1390	13 - 150	4714	Pro-28 to Ser-38,	S0001: 2	

HFEXGU34	703442	1391	38 - 193	4715	Pro-40 to Gln-46.	S0001: 2			
HFEXGU72	760639	1392	42 - 263	4716	His-1 to Pro-10, Lys-21 to Asp-37, Ser-62 to Trp-67.	S0001: 2			
HFEXGV29	690660	1393	34 - 117	4717	Asn-1 to Ser-7.	S0001: 2			
HFEXGV67	751653	1394	57 - 197	4718	His-9 to Ser-14.	L0794: 12, H0455: 2, S0051: 2, L0776: 2, L0789: 2, L0439: 2, S0001: 1, S0222: 1, L0157: 1, L0370: 1, L0768: 1, L0805: 1, L0755: 1 and L0759: 1.			
HFEXGW18	935500	1395	3 - 191	4719	His-1 to Trp-9, Pro-23 to Glu-31, Glu-37 to Cys-44, Lys-47 to Leu-59.	S0001: 2			
HFEXGW59	720353	1396	2 - 298	4720	Glu-40 to His-54, Pro-76 to Cys-82, Thr-88 to Arg-99.	S0001: 2			
HFEXGX80	694361	1397	2 - 220	4721	Arg-15 to Ala-20, Glu-25 to Asp-31, Ser-52 to Thr-73.	S0001: 3			
HFEXGX95	721820	1398	2 - 271	4722	Gly-17 to Ser-23, Thr-54 to Cys-60.	H0052: 2, H0009: 2, S0001: 1, L0438: 1 and L0439: 1.			
HFEXGZ18	854427	1399	1 - 189	4723	Gly-1 to Gln-6.	S0001: 2			
HFEXGZ20	767672	1400	1 - 132	4724	Arg-18 to Gly-24.	S0001: 2, H0438: 1 and H0052: 1.			

HFXXGZ84	974958	1401	198 - 410	4725	Arg-1 to Lys-15, Gln-36 to Gly-44, Gly-57 to Gly-63.	S0001: 3		
HFXXHA49	722992	1402	2 - 139	4726	Ser-12 to Arg-18, Thr-35 to Pro-42.	S0001: 2		
HFXXHC89	935801	1403	109 - 306	4727	Ala-15 to Cys-22, Gly-26 to Glu-37.	S0001: 2		
HFXXHI38	709047	1404	120 - 233	4728	Asn-1 to Arg-16, Ser-23 to Tyr-34.	S0001: 2		
HFXXHI53	777939	1405	165 - 374	4729	Lys-38 to Pro-43.	S0001: 3		
HFXXHJ17	663837	1406	146 - 433	4730	Ser-49 to Gly-60.	S0001: 2		
HFXXHJ26	681736	1407	1 - 180	4731	Arg-46 to Pro-52.	S0001: 2		
HFXXHJ52	727152	1408	157 - 372	4732	Lys-22 to Gln-28, Trp-35 to Tyr-54.	AR089: 1, AR061: 0 S0001: 2		
HFXXHK15	660269	1409	285 - 425	4733	Asn-7 to Leu-22.	S0001: 2		
HFXXHK21	670916	1410	2 - 214	4734	Ser-16 to Ser-22, Ala-41 to Asp-48.	S0001: 2		
HFXXHK60	740382	1411	3 - 251	4735		S0001: 2		
HFXXHL22	674595	1412	56 - 223	4736	Pro-28 to Pro-41, Val-48 to Cys-54.	S0001: 2		
HFXXHL44	715895	1413	25 - 375	4737	Arg-1 to Asp-6, Gly-70 to Trp-75, His-93 to Gly-114.	S0001: 2		
HFXXHN10	964637	1414	170 - 418	4738	Ser-15 to Ile-33.	S0001: 2		
HFXXHN12	970679	1415	114 - 404	4739	Arg-18 to Gly-27.	S0001: 2		
HFXXHN47	720338	1416	1 - 78	4740	Ser-14 to Arg-19.	S0001: 2		
HFXXHO16	615233	1417	2 - 379	4741	Gln-1 to Arg-8, Gly-34 to His-60.	S0001: 2		

HFHXHO20	959442	1418	247 - 426	4742	Pro-74 to Pro-97.	S0001: 2		
HFXXJB75	578304	1419	2 - 196	4743	Pro-42 to Ser-48.	S0010: 2 and S0282: 1.		
HFXXJC93	681290	1420	1 - 141	4744	Pro-36 to Cys-43.	S0282: 1 and S0300: 1.		
HFXXJD33	973683	1421	2 - 493	4745	Arg-26 to Pro-32, Ser-47 to Pro-57, Arg-69 to Phe-75, Glu-95 to Pro-100, Cys-134 to Gly-145, Ser-154 to Val-162.	S0282: 1 and S0222: 1.		
HFXXJD37	708446	1422	1 - 222	4746	Gln-1 to Trp-9, Glu-16 to Asp-22.	S0282: 2		
HFXXJH83	975187	1423	2 - 190	4747	Gln-1 to Arg-8, Gln-35 to Ala-54, Asn-56 to Asn-63.	S0282: 1 and S0031: 1.		
HFXXJO85	774884	1424	157 - 348	4748	Pro-20 to Ala-41, Pro-57 to Ala-62.	S0282: 2		
HFXXJO94	720876	1425	323 - 481	4749	Asn-1 to Gly-8.	S0282: 1 and S0031: 1.		
HFXXJP77	659523	1426	62 - 259	4750	Thr-5 to Gly-11.	AR061: 5, AR089: 2 S0282: 1 and S0031: 1.		
HFXXJQ50	724254	1427	53 - 169	4751		S0282: 1 and S0260: 1.		
HFXXJT94	794258	1428	21 - 446	4752	Gln-69 to Arg-87, Gly-107 to Ser-114.	S0282: 1 and S0260: 1.		
HFXXJV85	848049	1429	678 - 848	4753		L0770: 10, L0438: 3, L0439: 3, L0756: 3, T0010: 2, L0769: 2, L0599: 2, H0170: 1, S0282: 1, H0438: 1,		

								S0010: 1, S0048: 1, S0388: 1, S0036: 1, L0369: 1, L0638: 1, L0768: 1, L0775: 1, L0740: 1, L0747: 1 and S0412: 1.			
HFXJW02	919713	1430	3 - 146	4754	Asn-1 to His-17.			S0282: 2			
HFXJY18	666314	1431	138 - 299	4755	Glu-24 to Gln-30.			S0282: 1, H0392: 1, S0388: 1, L0532: 1 and L0748: 1.			
HFXKA64	746477	1432	2 - 418	4756	Gln-8 to Arg-17, Gln-92 to Arg-98.			S0282: 2			
HFXKB29	686509	1433	129 - 266	4757				S0282: 2			
HFXKB60	778958	1434	110 - 244	4758	Pro-12 to Ser-29.			S0282: 2			
HFXKD19	667604	1435	221 - 415	4759				S0282: 1, L0747: 1 and S0031: 1.			
HFXKK28	686507	1436	2 - 211	4760				S0282: 2			
HFXKL93	781115	1437	9 - 182	4761	Ala-25 to Cys-30, Ser-47 to His-52.			S0282: 1 and S0260: 1.			
HFXKU78	926411	1438	310 - 675	4762				L0756: 2, S0282: 1, S0007: 1, S0300: 1, H0455: 1, S0036: 1 and L0439: 1.			
HFXKX17	675391	1439	1 - 351	4763	Glu-41 to Ser-46.			S0222: 2, S6024: 1, S0282: 1, L0769: 1 and L0752: 1.			
HFXKX71	600724	1440	62 - 340	4764	Ala-5 to Cys-13, Arg-40 to Val-46.			S0260: 2 and S0282: 1.			

HFXKZ11	966844	1441	367 - 603	4765	Arg-2 to Ala-7, Arg-22 to Ala-34, Pro-37 to Asp-46.	S0282: 1, S0050: 1 and S0260: 1.		
HFXLD19	854357	1442	3 - 293	4766		S0282: 1 and H0340: 1.		
HFXLF45	717246	1443	61 - 303	4767	Arg-1 to Ile-7.	S0282: 2		
HFXLJ27	734913	1444	372 - 530	4768	Cys-1 to Gly-8.	S0001: 1 and S0282: 1.		
HFXLJ16	792004	1445	249 - 380	4769	Gly-14 to Thr-24.	S0282: 1 and S0386: 1.		
HFXLK81	775207	1446	58 - 282	4770		S0001: 3 and S0282: 1.		
HFXLL07	952388	1447	101 - 367	4771		S0001: 1 and S0282: 1.		
HFXLL44	871958	1448	43 - 183	4772		S0282: 2		
HFXLM65	747444	1449	120 - 263	4773		S0282: 2		
HFXLM94	793661	1450	60 - 275	4774		S0282: 2		
HFXLN18	793183	1451	1 - 183	4775	Cys-32 to Gly-38.	S0001: 1 and S0282: 1.		
HFXLN42	713228	1452	154 - 402	4776	Lys-17 to Ala-43, Pro-46 to Lys-64, Ser-66 to Trp-83.	S0282: 1, S0222: 1, L0749: 1, L0779: 1 and L0599: 1.		
HFXLP61	741199	1453	271 - 504	4777	Thr-1 to Asp-7.	S0282: 2		
HFXLQ90	788510	1454	98 - 466	4778	His-1 to Ala-6, Pro-11 to Asn-16, Glu-26 to Arg-31, Ser-37 to Ala-42.	S0282: 2		
HFXLR93	791922	1455	94 - 318	4779		S0282: 1, S0010: 1, L0439: 1 and L0592: 1.		
HHPAC34	507114	1456	330 - 187	4780	Tyr-1 to Ser-7, Asn-40 to Leu-46.	H0020: 2 and L0400: 1.		
HHPBA50	557805	1457	190 - 68	4781		L0743: 2, L0748: 2, H0052: 1, H0194: 1, H0051: 1, L0764: 1.		

HHPIB183	503448	1458	1 - 177	4782	Thr-19 to Gly-28, Val-51 to Pro-58.	L0776: 1 and L0747: 1.	
HHPCCE51	509624	1459	138 - 338	4783	Gln-21 to Gly-27.	H0327: 1 and H0051: 1.	
HHPCCE73	509625	1460	55 - 159	4784	Lys-10 to His-17.	H0051: 2	
HHPCIB34	503575	1461	91 - 336	4785	Pro-21 to Arg-27.	H0051: 2	
HHPCIC62	502791	1462	19 - 120	4786	Leu-3 to Asp-11, Glu-19 to Lys-25.	H0051: 1 and S0038: 1. H0051: 2	
HHPCJC66	734347	1463	179 - 292	4787		H0051: 1 and S0036: 1.	
HHPCCK61	667939	1464	362 - 571	4788	His-2 to Thr-10.	H0051: 2	
HHPCNI16	500783	1465	219 - 311	4789		H0051: 2	
HHPCDB53	727327	1466	2 - 184	4790		H0051: 1 and S0386: 1.	
HHPCDQ10	968666	1467	247 - 378	4791		S0222: 1, H0438: 1 and H0051: 1.	
HHPCDQ72	509367	1468	100 - 294	4792	Pro-3 to Gly-12.	H0051: 2	
HHPCDZ35	575363	1469	182 - 322	4793	Ile-7 to Asp-12, Ser-33 to Asn-40.	H0051: 2	
HHPECE87	536832	1470	1 - 243	4794	Lys-72 to Gln-80.	H0051: 2 and S0001: 1.	
HHPEFI16	921870	1471	174 - 302	4795		H0051: 2	
HHPEFI61	951999	1472	256 - 426	4796	Arg-1 to Ser-6, Gly-24 to Ile-32.	H0052: 3, L0005: 1, H0455: 1, H0051: 1, S0388: 1, L0521: 1, L0439: 1, L0756: 1, L0755: 1 and S0260: 1.	
HHPEK21	522742	1473	3 - 131	4797	Pro-22 to Ser-28.	S0001: 1 and H0051: 1.	
HHPEL02	921286	1474	428 - 595	4798	Pro-23 to Lys-29, Asn-39 to Leu-45.	H0565: 1 and H0051: 1.	
HHPEFA17	530413	1475	3 - 203	4799	Gly-6 to Trp-13.	H0052: 1 and H0051:	

[illegible]

HHPSA46	531637	1492	120 - 260	4816			H0201: 2		
HHPSA91	525403	1493	193 - 321	4817			H0052: 1 and H0201: 1.		
HHPSD03	960882	1494	52 - 195	4818			H0052: 1 and H0201: 1.		
HHPSD94	781807	1495	31 - 303	4819	Asn-54 to Arg-59.		H0052: 1 and H0201: 1.		
HHPSE14	526139	1496	134 - 325	4820			H0194: 1 and H0201: 1.		
HHPSE40	526169	1497	21 - 161	4821	Asn-12 to Asn-23.		H0194: 1 and H0201: 1.		
HHPSE50	526136	1498	211 - 402	4822			H0052: 1 and H0201: 1.		
HHPSH93	526103	1499	169 - 327	4823			H0261: 1 and H0201: 1.		
HHPSM45	526104	1500	54 - 131	4824			H0201: 2		
HHPSP66	799988	1501	32 - 253	4825	Glu-1 to Gly-10, Gln-17 to Cys-27, Ser-45 to Ser-50.		H0052: 1 and H0201: 1.		
HHPSP84	526084	1502	1 - 222	4826	Asn-34 to Asn-41.		H0052: 1 and H0201: 1.		
HHPSQ04	929251	1503	43 - 240	4827	Pro-9 to Asp-18.		H0201: 3		
HHPSQ38	960387	1504	212 - 325	4828			H0201: 2		
HHPTC15	857193	1505	92 - 331	4829	Lys-54 to Gly-80.		S6024: 1 and S0112: 1.		
HHHAD04	927685	1506	73 - 168	4830	Lys-3 to Gly-14.		S0051: 2		
HHSAE29	743166	1507	2 - 325	4831			AR061: 2, AR089: 1 S0282: 1 and S0051: 1.		
HHAG04	527836	1508	1 - 150	4832			S0051: 2 and L0731: 1.		

HHSAP15	527829	1509	10 - 84	4833	Phe-8 to His-13.	S0051: 2		
HHSAP15	527829	1509	10 - 84	4833	Phe-8 to His-13.	L0794: 12, H0455: 2, S0051: 2, L0776: 2, L0789: 2, L0439: 2, S0001: 1, S0222: 1, L0157: 1, L0370: 1, L0768: 1, L0805: 1, L0755: 1 and L0759: 1.		
HHSAP15	527829	1509	10 - 84	4833	Phe-8 to His-13.	S0051: 2		
HHSAP15	527829	1509	10 - 84	4833	Phe-8 to His-13.	S0051: 2, L0776: 2 and H0052: 1.		
HHSBA07	954099	1511	1 - 123	4835				
HHSBA29	577730	1512	41 - 244	4836	Ile-11 to Trp-16, Ser-54 to Ser-59.			
HHSBH42	504229	1513	412 - 122	4837	Leu-17 to Gly-34, Cys-78 to Cys-84.	L0742: 13, L0439: 6, L0438: 3, S0010: 2, S0628: 2, L0756: 2, S0346: 1, S0051: 1, T0010: 1 and L0789: 1.		
HHSBJ49	752651	1514	141 - 458	4838		S0010: 1, S0051: 1 and S0412: 1.		
HHSBK36	527820	1515	1 - 246	4839		S0051: 2		
HHSBK60	686666	1516	706 - 1011	4840	Asp-40 to Arg-46.	L0748: 5, L0747: 2, L0749: 2, L0600: 2, H0392: 1 and S0051: 1.		
HHSBL50	575654	1517	160 - 279	4841		S0051: 2		
HHSBO03	954597	1518	105 - 320	4842	Lys-5 to Pro-10.	S0051: 2		
HHSBO68	752241	1519	1 - 309	4843	Thr-11 to Gly-17, Lys-49 to Leu-54, Pro-57 to Gly-62.	S0051: 2		
HHSC42	715578	1520	142 - 342	4844	Ser-1 to Lys-6,	S0051: 2 and L0747: 1.		

HHCL82	507188	1521	370 - 242	4845	Arg-30 to His-44.			
HHSCN65	507187	1522	140 - 307	4846	Ser-10 to Pro-18.	S0051: 2 and L0439: 1.		
HHSCQ45	577694	1523	2 - 241	4847	Cys-22 to Gly-28.	S0051: 2		
HHSCW58	871538	1524	114 - 332	4848		S0051: 2		
HHSCX56	840167	1525	17 - 418	4849	Gly-17 to Glu-22, Gly-43 to Tyr-49.	S0049: 1, H0052: 1, S0051: 1 and L0439: 1.		
HHSDA46	576378	1526	155 - 469	4850	Gly-16 to Pro-22.	S0051: 2		
HHSDDB91	577723	1527	169 - 282	4851	Glu-27 to Asp-38.	S0051: 2		
HHSDDB95	772525	1528	89 - 319	4852		S0049: 1 and S0051: 1.		
HHSDDF46	717900	1529	233 - 454	4853	Gly-12 to Cys-17, Gly-23 to His-30.	S0282: 1 and S0051: 1.		
HHSDG11	964971	1530	136 - 339	4854	Gln-20 to Asn-25.	H0438: 1 and S0051: 1.		
HHSDJ43	937597	1531	224 - 613	4855	Pro-38 to Gly-51, Gly-57 to Ser-66, Cys-90 to Gly-96, Leu-108 to Lys-128.	L0753: 3, S0222: 2, L0776: 2, H0455: 1, H0571: 1, S0051: 1, S0628: 1, L0794: 1, L0805: 1, L0635: 1, L0750: 1 and S0412: 1.		
HHSDQ07	953524	1532	233 - 424	4856	Gly-1 to Ile-6.	S0051: 1, S0036: 1, L0756: 1 and S0031: 1.		
HHSDW33	576101	1533	3 - 185	4857	Ala-35 to Gly-41.	S0051: 2		
HHSDX77	531654	1534	119 - 328	4858		S0036: 3, S0010: 2, S0222: 1, S0049: 1, L0113: 1, S0051: 1, L0761: 1, L0789: 1, L0439: 1 and S0106: 1.		
HHSEC92	577734	1535	3 - 134	4859		S0051: 2		

HHSEH95	578165	1536	352 - 507	4860	Thr-18 to Glu-27.	H0052: 1, S0051: 1 and L0792: 1.		
HHSFA80	703047	1537	141 - 371	4861		S0388: 2, S0051: 1, L0803: 1, L0647: 1 and L0756: 1.		
HHSFB64	746149	1538	354 - 623	4862	Phe-11 to Lys-16.	S0050: 1 and S0388: 1.		
HHSFD46	718648	1539	227 - 403	4863		S0388: 2		
HHSFF57	657376	1540	1 - 180	4864	Phe-5 to Ser-11, Val-17 to Lys-24, Glu-27 to Asp-34, Ser-36 to Cys-42, Lys-52 to Lys-60.	S0010: 1, S0388: 1 and L0559: 1.		
HHSFK15	659633	1541	47 - 274	4865	Pro-7 to Gln-13.	S0388: 2		
HHSFS03	923352	1542	2 - 160	4866		S0388: 2		
HHSFT03	923351	1543	190 - 318	4867		H0052: 1 and S0388: 1.		
HHSFT46	660539	1544	25 - 303	4868	Thr-1 to Ser-10, Ser-12 to Gly-19.	H0052: 1 and S0388: 1.		
HHSFU07	952461	1545	71 - 418	4869		S0388: 1 and S0051: 1.		
HHSGB25	677631	1546	51 - 179	4870		S0388: 2		
HHSGP51	958573	1547	376 - 546	4871	Lys-13 to Lys-21.	S0414: 2, S0222: 1, S0388: 1 and S0031: 1.		
HHS GS72	757132	1548	458 - 640	4872		S0388: 1 and S0260: 1.		
HHTLC51	716578	1549	21 - 326	4873	Thr-11 to Glu-16, Gly-33 to Trp-40, Leu-56 to Trp-66.	S6014: 2		
HHTLC94	968571	1550	421 - 738	4874	Glu-39 to Trp-47, Lys-59 to Asn-65, Lys-86 to Arg-100.	L0756: 4, L0777: 3, L0779: 2, S6014: 1, H0052: 1, T0010: 1,		

								L0770: 1, L0794: 1, L0809: 1 and L0758: 1.		
HHTLF39	578737	1551	61 - 312	4875			Pro-33 to Thr-43.	S6014: 2		
HHTLG74	576611	1552	283 - 528	4876				S6014: 1 and S0051: 1.		
HHTMG34	674575	1553	1 - 105	4877				S0220: 2		
HHTMG45	937035	1554	3 - 584	4878				AR061: 1, AR089: 1 S0220: 1 and S0050: 1.		
HHTMN62	455423	1555	161 - 346	4879			Arg-1 to Thr-10.	AR089: 1, AR061: 0 S0220: 1 and S0051: 1.		
HIBBC72	761180	1556	3 - 380	4880			Lys-100 to Phe-110.	L0439: 3, S0222: 1 and T0010: 1.	107777, 123940, 139350, 139350, 148040, 148041, 148043, 148070, 231550, 600194, 600231, 600536, 600808, 600956, 601284, 601769, 601769, 601928, 602116, 602153	12q13

HIBBT89	900210	1557	2 - 358	4881	Arg-10 to Gly-27, Arg-47 to Cys-53, His-88 to Gly-99.	H0392: 1 and T0010: 1.		
HIBCE66	504317	1558	163 - 56	4882		T0010: 2		
HIBCF12	537084	1559	229 - 489	4883	Ser-14 to Trp-26.	T0010: 3	10q23.3-q24	138130, 157640, 174900, 180250, 186770, 203300, 236730, 271245, 278000, 278000, 600095, 600512, 601107, 601130, 601728, 601728, 601728, 602082
HIBCF31	578651	1560	290 - 469	4884		S0222: 1, S0010: 1, S0346: 1 and T0010: 1.		
HIBCH54	537073	1561	275 - 3	4885	Arg-22 to Lys-27, Pro-53 to Arg-61, Pro-69 to Met-83.	L0742: 4, T0010: 2 and L0748: 1.		
	537074	3247	3 - 143	6571	Ser-10 to Gln-24.			

HIBCI36	504291	1562	418 - 71	4886	Cys-66 to Glu-73, Leu-87 to His-94.	L0439: 4, S0007: 2, S0010: 2, L0743: 2, L0756: 2, L0757: 2, L0366: 2, L0005: 1, S0222: 1, T0010: 1, L0638: 1, L0648: 1, L0805: 1 and L0776: 1.		
HIBCK75	836031	1563	360 - 169	4887	His-3 to Trp-8, Gly-17 to Gly-22.	T0010: 4, L0415: 2, S0049: 2, H0052: 2, L0351: 2, L0805: 2, S0026: 1, H0618: 1 and S0010: 1.		
HIBCL79	930466	1564	374 - 150	4888		L0439: 5, L0438: 2, S0001: 1 and T0010: 1.		
HIBCL80	504270	1565	561 - 256	4889		L0794: 4, S0001: 2, L0805: 2, L0438: 2, L0439: 2, T0010: 1, L0141: 1, L0351: 1, L0789: 1, L0742: 1 and L0756: 1.		
HIBCM08	857576	1566	537 - 788	4890	Arg-28 to Cys-35.	T0010: 2, H0052: 1 and L0351: 1.		
HIBCCQ38	507104	1567	166 - 2	4891	Ile-48 to Lys-55.	T0010: 2, L0439: 2 and L0741: 1.		
HIBCT24	945204	1568	146 - 454	4892	Thr-1 to Ser-16.	L0439: 26, L0742: 7, L0766: 6, T0010: 4, L0351: 4, L0779: 3, H0455: 2, H0052: 2, L0769: 2, L0438: 2,		

								S6024: 1, S0001: 1, L0770: 1, L0768: 1, L0794: 1, L0776: 1, L0352: 1, L0745: 1, L0777: 1, L0753: 1 and L0758: 1.			
HIBCW65	753950	1569	243 - 58	4893		Asn-14 to Lys-20.		T0010: 2			
HIBDB88	504185	1570	1 - 318	4894		His-11 to Gln-22, Leu-41 to Glu-48, Pro-51 to Gln-60.		H0194: 1 and T0010: 1.			
HIBDE04	925514	1571	272 - 78	4895				S0030: 1 and T0010: 1.			
HIBDE84	504180	1572	414 - 196	4896				L0439: 8, L0351: 3, T0010: 2, L0438: 2, L0747: 2, H0327: 1, L0769: 1, L0800: 1, L0352: 1, L0740: 1, L0751: 1, L0745: 1, L0750: 1, L0756: 1 and L0777: 1.			
HIBEB18	536995	1573	237 - 509	4897				H0052: 1 and T0010: 1.			
HIBEF51	890949	1574	434 - 297	4898		His-1 to Gly-8.		AR051: 10, AR050: 2, AR089: 1, AR054: 0, AR061: 0 L0439: 2, S0222: 1, T0010: 1 and L0794: 1.			
	890950	3248	193 - 65	6572		Pro-10 to Ser-22.					
HIBEG58	504155	1575	7 - 210	4899		Thr-2 to Arg-10.		L0756: 4, L0777: 3, L0779: 2, S6014: 1,			

									H0052: 1, T0010: 1, L0770: 1, L0794: 1, L0809: 1, L0439: 1 and L0758: 1.		
HIBEJ82	537044	1576	295 - 468	4900					L0439: 5 and T0010: 2.		
	537054	3249	153 - 1	6573							
HIBEK35	731480	1577	3 - 416	4901					AR089: 0, AR061: 0 T0010: 2		
HIBEN23	503401	1578	304 - 543	4902					L0439: 3, T0010: 1 and S6028: 1.		
	503402	3250	563 - 402	6574							
HIBEO65	854491	1579	55 - 432	4903					S0001: 2, L0163: 2, T0010: 2, H0455: 1 and L0741: 1.		
HKB1E62	840126	1580	30 - 221	4904					H0384: 2		
HKB1F66	766982	1581	181 - 14	4905					H0384: 2		
HKIYC19	668699	1582	1 - 111	4906					S0414: 12, L0439: 2, H0441: 1, L0157: 1 and L0742: 1.		
HMAPA26	681213	1583	178 - 35	4907					S0324: 2		
HMDAA14	523328	1584	52 - 177	4908					H0346: 2		
HMDAA15	856210	1585	68 - 265	4909					H0346: 2		
HMDAB42	522486	1586	72 - 239	4910					H0346: 2		
HMDAB83	529416	1587	78 - 338	4911					H0346: 2		

HMDAC12	655240	1588	2 - 121	4912	Gly-17 to Gln-39.	S6024: 1 and H0346: 1.		
HMDAE95	733133	1589	2 - 208	4913		H0346: 1 and S0300: 1.		
HMDAF13	529413	1590	130 - 201	4914		H0346: 2		
HMDAI83	529181	1591	188 - 340	4915	Gly-1 to Gln-10.	H0346: 2		
HMDAM04	973261	1592	243 - 518	4916	Lys-25 to Phe-30, Ala-87 to Asn-92.	S0001: 2 and H0346: 1.		
HMDAM09	968436	1593	89 - 205	4917		H0346: 2		
HMDAN08	960156	1594	316 - 116	4918	Pro-1 to Glu-13, Lys-59 to Gly-66.	H0346: 2		
HMDAN75	529175	1595	209 - 343	4919	Val-2 to Trp-18.	H0346: 2		
HMDAO41	519438	1596	181 - 360	4920	His-18 to His-26.	L0748: 2, H0346: 1, H0123: 1 and L0639: 1.		
HMDAO84	529183	1597	3 - 140	4921	Glu-19 to Ala-30.	H0346: 2		
HMLAA75	773671	1598	117 - 308	4922		L0770: 7, L0439: 4, L0805: 3, L0776: 2, L0438: 2, L0756: 2, L0415: 1, S0010: 1, H0390: 1, S6028: 1 and L0794: 1.		
HMLAE19	411462	1599	12 - 221	4923		S6028: 3		
	952985	3251	562 - 846	6575	Ser-84 to Gly-95.			
HMLAH17	887814	1600	352 - 561	4924	Cys-20 to Gly-25, Pro-62 to His-68.	AR051: 10, AR050: 9, AR054: 9 L0438: 2, L0439: 2, S0300: 1, S0222: 1, S0051: 1, S6028: 1, S0036: 1 and L0769: 1.		
HMLAH50	657039	1601	83 - 193	4925	Tyr-15 to Ser-25.	S6028: 2		

HMI AJ06	856073	1602	1 - 312	4926	Asn-25 to Gln-31, Glu-65 to Met-70.	S6028: 2		
HMI AJ40	710869	1603	57 - 209	4927	Tyr-29 to Tyr-34.	S6028: 2		
HMI AJ51	667917	1604	1 - 273	4928	Tyr-56 to Asp-61, Asp-63 to His-68.	H0570: 1 and S6028: 1.		
HMI AK65	960126	1605	186 - 332	4929		H0009: 1 and S6028: 1.		
HMI AK71	760229	1606	60 - 155	4930	Arg-1 to Leu-8.	S0010: 1 and S6028: 1.		
HMI AL17	662723	1607	313 - 441	4931	Phe-5 to His-12.	S6028: 1 and S0036: 1.		
HMI AL88	954264	1608	114 - 308	4932	Ser-60 to Arg-65.	H0052: 3 and S6028: 1.		
HMI AM41	576080	1609	215 - 367	4933		H0438: 1 and S6028: 1.		
HMI AN02	919521	1610	11 - 364	4934	Gly-39 to Arg-49.	S6028: 1 and S0038: 1.		
HMI AP49	854723	1611	100 - 363	4935	Ser-17 to Leu-24.	S0222: 1 and S6028: 1.		
HMI AQ31	697755	1612	66 - 431	4936	Ser-1 to Gly-10, Ser-27 to Glu-35.	S6028: 2 and L0439: 1.		
HMI AQ48	927336	1613	2 - 292	4937		S6028: 1 and S0386: 1.		
HMI AQ85	784242	1614	135 - 278	4938	Glu-10 to Tyr-16.	S6028: 2		
HMI AR44	717675	1615	202 - 318	4939		S6028: 2		
HMI AT16	945160	1616	393 - 719	4940	Pro-91 to Phe-98.	AR061: 9, AR089: 4 S0414: 3, S0036: 3, L0439: 3, H0327: 2, H0051: 2, S6028: 2, S0282: 1, H0406: 1, H0438: 1, S0010: 1, S0038: 1, S0260: 1 and S0412: 1.		
HMI AT93	717774	1617	258 - 635	4941		L0748: 3, S0222: 1 and S6028: 1.		
HMI AW57	733919	1618	84 - 233	4942	Pro-19 to Leu-36.	L0439: 9, S6028: 2 and		

HMIA Y95	795121	1619	157 - 522	4943			L0731: 1. H0052: 1, S6028: 1, L0748: 1 and L0731: 1.	12q13.3	181430, 232800, 600808, 601284, 601769, 601769, 602116
HMIA Z93	526087	1620	938 - 1201	4944	Thr-14 to His-20.		L0438: 2, L0439: 2, S6028: 1, S0036: 1 and L0592: 1.		
	871032	3252	352 - 89	6576	Thr-14 to His-20.				
	871033	3253	75 - 311	6577					
HMIBA83	781070	1621	2 - 166	4945			S0220: 1 and S6028: 1.		
HMIBD06	960080	1622	3 - 359	4946	Lys-1 to Asp-10.		S6028: 2 and S0051: 1.		
HMIBH81	578291	1623	258 - 133	4947			S0010: 1 and S6028: 1.		
HMIBU59	739134	1624	99 - 392	4948	Pro-1 to Gln-15, Pro-17 to Ile-23.		S6028: 2		
HMICG44	706228	1625	148 - 345	4949	Pro-10 to Glu-16, Arg-52 to Gly-57.		H0261: 1, S6028: 1 and L0731: 1.		
HMICG64	507373	1626	752 - 1108	4950	Pro-8 to Ser-13, Gln-20 to Asn-27, His-32 to Gly-37, Gly-45 to Gly-52.		L0439: 3, H0052: 2, S6028: 1, L0438: 1 and S0260: 1.		
HMICL18	666217	1627	255 - 410	4951	Lys-16 to Glu-23, Gln-28 to Phe-33.		S6028: 2 and L0439: 1.	Xq27.3	301201, 301590, 309550
HMICL72	761384	1628	133 - 369	4952	Ala-35 to Gly-40.		S0282: 1 and S6028: 1.		

HMICM17	662750	1629	3 - 119	4953			S0049: 1 and S6028: 1.		
HMICM88	733060	1630	41 - 280	4954	Ala-20 to Ser-26.		L0439: 4, S0346: 1 and S6028: 1.		
HMICO20	669540	1631	255 - 401	4955			S0300: 1 and S6028: 1.		
HMICQ32	911560	1632	2 - 400	4956	Asp-1 to Val-15.		S0222: 1, S6014: 1, S0010: 1, S6028: 1 and S0036: 1.		
HMICR35	927313	1633	373 - 585	4957	Ser-5 to Gly-10.		S0386: 2 and S6028: 1.		
HMICR53	707941	1634	3 - 413	4958			AR089: 5, AR061: 4 S0388: 1 and S6028: 1.		
HMICS71	625257	1635	124 - 372	4959	Asp-43 to Thr-49, Ser-56 to Asn-62.		S0222: 1 and S6028: 1.		
HMICT95	781870	1636	1 - 330	4960	Gly-34 to Lys-41.		H0052: 1 and S6028: 1.		
HMJAC89	573634	1637	1 - 144	4961	Pro-1 to Leu-6.		H0391: 2		
HMJAX08	959439	1638	179 - 424	4962			L0518: 2, H0391: 1 and H0172: 1.		
HMKAD61	856035	1639	56 - 223	4963	Trp-11 to Ala-18, Pro-48 to Asn-53.		H0392: 2		
HMKAD85	950537	1640	2 - 643	4964			AR061: 2, AR089: 1 S0007: 2, H0392: 2, L0745: 1, L0753: 1, L0759: 1 and L0589: 1.		
HMKAF33	702611	1641	60 - 131	4965			H0392: 1 and S0048: 1.		
HMKAF85	573520	1642	188 - 322	4966			H0392: 2		
HMKAJ50	950532	1643	3 - 593	4967	Pro-16 to Asn-26, Asn-35 to Thr-41, Asp-84 to Gly-91, Gln-108 to Thr-114,		AR050: 9, AR054: 7, AR061: 2, AR051: 2, AR089: 1 L0439: 11, L0438: 2,		

						Thr-119 to Phe-124, Asp-140 to Gln-146, Asp-160 to Gln-166.	L0592: 2, L0594: 2, S0001: 1, H0392: 1, L0157: 1 and L0647: 1.	
HMKAN04	661966	1644	7 - 93	4968			H0392: 2	
HMKAN22	954643	1645	2 - 382	4969		Pro-1 to Lys-6, Ser-105 to Trp-110.	H0392: 1, H0327: 1 and L0753: 1.	
HMKQAQ45	856026	1646	176 - 304	4970		Gln-15 to Glu-23.	H0392: 2 and L0790: 1.	
HMKQAQ68	753046	1647	25 - 279	4971		Gln-38 to Ser-43, Arg-67 to Asp-72.	H0392: 2	
HMKQAQ84	761387	1648	3 - 140	4972		Lys-1 to Gly-13, Val-15 to His-25.	H0392: 2	
HMKBB12	970710	1649	1 - 159	4973		Pro-16 to Ala-23.	H0392: 2	
HMKCG93	774048	1650	86 - 211	4974		Glu-29 to Gln-35.	H0392: 2	
HMKCL73	703815	1651	513 - 310	4975		Ala-7 to His-14, Ser-43 to Tyr-54.	S0300: 1, H0392: 1 and L0756: 1.	
HMKCM71	757173	1652	148 - 53	4976			H0392: 2	
HMKCO80	773577	1653	247 - 429	4977		Glu-1 to Gln-10.	H0392: 2	
HMKCR24	856019	1654	100 - 339	4978			H0392: 1 and H0052: 1.	
HMKCS68	745075	1655	174 - 332	4979		Asn-1 to Lys-8.	H0392: 2	
HMKCS72	761388	1656	1 - 162	4980			H0392: 2	
HMKCU71	971166	1657	2 - 295	4981		Lys-14 to Lys-21, Pro-25 to Lys-33, Arg-49 to Val-54, Asp-91 to Leu-97.	S0001: 1 and H0392: 1.	
HMKCU76	746565	1658	56 - 292	4982		Leu-11 to Glu-16.	H0392: 2	
HMKCW25	678108	1659	194 - 424	4983		Asn-1 to Arg-8,	H0392: 2	

HMKCW50	697992	1660	2 - 175	4984	Glu-23 to Ser-33, Arg-41 to Lys-53.			
HMKCX93	792305	1661	165 - 293	4985	Arg-1 to Ala-9, Ser-48 to Phe-56.	H0392: 2		
HMKCY47	674588	1662	192 - 317	4986	Arg-14 to Pro-21.	H0392: 2		
HMKCZ94	734756	1663	165 - 320	4987	Lys-26 to Phe-34.	H0392: 2		
					Leu-7 to Leu-12, Gln-20 to Asn-34.	H0392: 2		
HMKDB20	685682	1664	296 - 442	4988		H0392: 2		
HMKDB91	789418	1665	235 - 531	4989		L0743: 3, L0439: 3, H0392: 1 and T0010: 1.		
HMKDC24	970672	1666	193 - 447	4990		H0392: 2		
HMKDD11	967031	1667	252 - 467	4991	Lys-50 to Thr-57.	H0392: 2		
HMKDD54	731762	1668	269 - 451	4992		H0392: 2		
HMKDGG32	424740	1669	368 - 484	4993	Tyr-34 to Ser-39.	S0001: 1, H0392: 1 and L0366: 1.		
HMKDGG40	669307	1670	2 - 331	4994	Trp-3 to Tyr-21, Arg-23 to Ser-41, Cys-44 to Trp-80, Thr-85 to Leu-93.	H0392: 2	8q24.2	188450, 188450, 188450
HMKDHH33	659530	1671	318 - 551	4995	Asp-1 to Asn-8, Tyr-11 to Asn-19.	H0392: 2		
HMKDK48	721650	1672	179 - 274	4996	Ser-5 to Lys-13.	S0222: 1 and H0392: 1.		
HMKDR16	835914	1673	1 - 99	4997	Arg-18 to His-23.	H0392: 2		
HMKDR76	698319	1674	193 - 366	4998	Ala-1 to Gln-9.	H0392: 1 and H0123: 1.		
HMKDZ40	686667	1675	232 - 429	4999	Ser-17 to Ser-23, Asp-35 to Ser-41.	H0392: 2		

HNGHQ60	974572	1676	1 - 51	5000		S0010: 66, S0031: 59, S0036: 56, H0051: 48, L0439: 46, S0260: 39, H0327: 34, L0756: 33, S0282: 29, S6028: 22, S0051: 17, L0598: 14, H0438: 13, S0388: 13, S0346: 12, H0441: 9, S0028: 9, H0310: 8, L0740: 8, S0222: 6, S0049: 5, H0100: 5, H0052: 4, S0050: 4, S0038: 4, S0053: 4, H0340: 3, S6026: 3, H0013: 3, T0010: 3, S0112: 3, L0748: 3, H0170: 2, S6024: 2, H0455: 2, H0598: 2, S0386: 2, L0742: 2, L0752: 2, S0412: 2, H0171: 1, S0040: 1, S0110: 1, S0029: 1, H0384: 1, S0300: 1, S0278: 1, H0389: 1, S6014: 1, S0220: 1, S0414: 1, H0575: 1, H0363: 1, H0041: 1, H0050: 1, H0024: 1, H0320: 1, H0006: 1,		
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HOUBD73	973511	1677	700 - 1005	5001	<p>H0201: 1, S0048: 1, H0399: 1, H0328: 1, H0064: 1, H0372: 1, H0059: 1, S0039: 1, S0052: 1, H0144: 1, S0168: 1 and L0750: 1.</p> <p>AR051: 3, AR054: 2, AR050: 1 S0031: 192, H0051: 165, S0010: 159, S0260: 107, S0282: 91, H0052: 86, S0051: 80, H0327: 79, S0222: 73, S0036: 66, S0388: 41, S0346: 39, S0049: 28, S6014: 23, S0112: 23, H0441: 21, L0439: 20, S6028: 19, S0038: 18, S0386: 17, L0366: 17, S0220: 16, T0010: 15, H0100: 15, H0438: 14, H0261: 12, L0756: 12, S6024: 11, S0050: 11, L0351: 11, L0742: 9, H0310: 8, S0048: 8, S0029: 7, H0455: 7, S0028: 7, N0009: 6, H0064: 6, S0053: 6, L0769: 5, S0030: 4, H0006: 4,</p>		
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HSDAI45	968392	1680	497 - 925	5004	Thr-1 to Gly-7, Ser-22 to Met-28, Ser-53 to Met-59, Asn-77 to Leu-82, Glu-96 to Phe-105, Phe-111 to Arg-116, Arg-121 to Asp-126.	S0001: 1, S0031: 1 and S0260: 1.		
HSDBM77	531316	1681	3 - 134	5005		S0106: 2		
HSDDDD95	833399	1682	1 - 141	5006		S0031: 2		
HSDEB18	666608	1683	49 - 333	5007	Ser-9 to Ser-22.	H0409: 1 and S0031: 1.		
HSDEB49	714463	1684	176 - 286	5008		S0031: 2		
HSDEB69	835998	1685	79 - 171	5009		S0031: 2		
HSDEI24	578732	1686	50 - 193	5010	Asn-23 to Ala-31.	S0031: 2		
HSDEK72	671934	1687	3 - 596	5011	Trp-1 to His-9.	S0051: 1 and S0031: 1.		
HSDEM83	760735	1688	140 - 283	5012		S0001: 1 and S0031: 1.		
HSDEO07	953601	1689	338 - 628	5013	Gln-10 to Lys-15.	S0031: 2 and L0750: 1.		
HSDEQ95	765604	1690	188 - 481	5014	Arg-1 to Asp-9.	S0031: 2		
HSDES11	967281	1691	2 - 280	5015	Ala-1 to Lys-34, Glu-56 to Val-63, Ser-66 to Glu-75.	S0010: 1 and S0031: 1.		
HSDEV64	781273	1692	52 - 354	5016	Gln-36 to Pro-42.	S0031: 2		
HSDEW28	668683	1693	215 - 358	5017	Lys-43 to Tyr-48.	S0031: 2		
HSDEX11	919078	1694	122 - 310	5018	Asn-1 to Asn-6, Pro-26 to Glu-33.	S0388: 1 and S0031: 1.		
HSDEY47	578742	1695	63 - 125	5019		S0031: 2		
HSDFD49	723083	1696	127 - 258	5020	Arg-1 to Pro-6, Pro-16 to Arg-21.	S0001: 1 and S0031: 1.		
HSDFE68	572610	1697	85 - 243	5021	Ser-2 to Asn-9.	S0010: 1 and S0031: 1.		

						Ser-30 to Ser-35.				
HSDFE90	750270	1698		1 - 162	5022				S0031: 2	
HSDFU66	773606	1699		13 - 240	5023	Gln-6 to Ser-14.			S0031: 2	
HSDFV12	908628	1700		1 - 837	5024			AR061: 107, AR089: 62 L0771: 2, L0666: 2, L0755: 2, S6024: 1, H0123: 1, L0650: 1, L0792: 1, L0750: 1, L0779: 1, L0777: 1 and S0031: 1.		
HSDFV33	702470	1701		227 - 397	5025	Lys-12 to Trp-18, Gly-27 to Ile-41.			S0031: 2	
HSDFV41	711658	1702		3 - 215	5026	Ile-8 to Ser-22.			S0031: 2	
HSDFW82	779900	1703		73 - 252	5027	Phe-3 to Arg-8.			S0386: 1 and S0031: 1.	
HSDFX35	707641	1704		237 - 395	5028				S0031: 2	
HSDFX84	937607	1705		108 - 188	5029	Phe-20 to Asn-26.			S0031: 2	
HSDFY34	768499	1706		300 - 380	5030				S0031: 2	
HSDGD83	789437	1707		52 - 135	5031				S0031: 1 and S0260: 1.	
HSDGE95	795082	1708		126 - 302	5032				S0031: 2	
HSDGH67	778652	1709		3 - 266	5033	Gln-57 to Gly-63.			AR061: 5, AR089: 2 S0031: 2	
HSDGI59	739307	1710		71 - 289	5034	Tyr-12 to Asn-20, Thr-58 to Gly-65.			S0031: 2	
HSDGK57	664981	1711		69 - 245	5035	Pro-15 to Cys-28, Pro-50 to Cys-57.			S0031: 2 and S0036: 1.	
HSDGL38	678324	1712		232 - 369	5036				H0052: 2 and S0031: 1.	
HSDGM44	715886	1713		172 - 324	5037	Phe-22 to Ser-27.			S0282: 1 and S0031: 1.	

HSDGN91	789404	1714	2 - 352	5038	Arg-48 to Arg-55, Pro-66 to His-84, Arg-112 to Gly-117.	S0031: 2		
HSDGP48	721701	1715	95 - 337	5039	Lys-24 to Ser-34, Lys-58 to Leu-64.	S0031: 3		
HSDGP74	765608	1716	2 - 355	5040	Ala-1 to Gln-24.	S0051: 1 and S0031: 1.19p13.3	108725, 120700, 133171, 136836, 145981, 147141, 164953, 188070, 600957, 601238, 601846, 602216, 602477	
HSDGR83	778916	1717	29 - 115	5041		S0031: 2		
HSDGS11	950699	1718	135 - 407	5042	Leu-6 to Arg-11, Leu-54 to Ser-62, Ser-68 to Pro-80.	L0756: 2, S0388: 1, L0776: 1 and S0031: 1.		
HSDGS14	658468	1719	129 - 416	5043	Lys-1 to Thr-9, Lys-34 to Phe-43, Arg-49 to Thr-62, Thr-71 to Gly-78.	L0777: 4, S0031: 2, H0051: 1, L0667: 1, L0805: 1, L0659: 1 and L0756: 1.		
HSDGS82	973807	1720	95 - 310	5044		S0031: 3		
HSDGS90	597178	1721	101 - 307	5045	Pro-17 to Pro-26, Leu-47 to Thr-61.	S0031: 2		

HSDGU11	973565	1722	75 - 323	5046	Arg-1 to Asn-14, Gln-21 to Glu-26, Arg-46 to Arg-61.	S0031: 2		
HSDGX54	730703	1723	15 - 173	5047	Thr-5 to Trp-13, Arg-45 to Thr-52.	S0031: 2		
HSDGX55	731776	1724	183 - 410	5048	His-1 to Asp-13.	S0282: 1 and S0031: 1.		
HSDHD88	768372	1725	3 - 224	5049	Asp-1 to Asp-6, Pro-17 to Ser-35, Gln-49 to Gly-57, Ala-59 to Arg-74.	S0031: 2		
HSDIA23	675295	1726	177 - 371	5050		S0386: 1 and S0260: 1.		
HSDIA41	690566	1727	41 - 355	5051	Pro-29 to Phe-34, Thr-84 to Asp-105.	S0260: 2		
HSDIB16	661837	1728	185 - 517	5052	Glu-33 to Ala-47, Ala-51 to Gly-60, Pro-71 to Trp-77, Trp-84 to Glu-90.	S0051: 1 and S0260: 1.		
HSDIC73	765710	1729	298 - 558	5053		AR089: 18, AR061: 10 S0031: 1 and S0260: 1.		
HSDID72	967682	1730	42 - 272	5054	Glu-36 to Lys-50, Asn-57 to Pro-62.	S0051: 1, L0777: 1 and S0260: 1.		
HSDIE88	698866	1731	308 - 487	5055		S0300: 1, L0754: 1, L0750: 1 and S0260: 1.		
HSDIS34	972454	1732	1 - 453	5056		AR061: 3, AR089: 1 S0260: 2 and S0001: 1.		
HSDIS53	469334	1733	2 - 310	5057	Glu-6 to Ser-19, Pro-22 to Asp-29.	S0260: 2		
HSDIS78	608311	1734	3 - 293	5058	Asn-2 to Cys-10,	S0260: 2		

							Glu-13 to Gly-20, Arg-38 to Met-51.					
HSDIT43	839603	1735	1 - 393	5059						AR061: 4, AR089: 2 S0050: 1 and S0260: 1. S0260: 2		
HSDIV08	959250	1736	210 - 419	5060								
HSDIW51	721583	1737	1 - 321	5061			Glu-89 to Lys-94.			AR089: 0, AR061: 0 S0260: 2		
HSDIX53	855432	1738	264 - 473	5062			Leu-11 to Met-16.			S6024: 1 and S0260: 1.		
HSDIY72	880541	1739	2 - 172	5063			Ser-4 to Tyr-16, Leu-20 to Cys-27.			H0051: 1 and S0260: 1.		
HSDIZ64	786820	1740	360 - 773	5064			Lys-1 to Gly-9, Gly-41 to Gln-49, Leu-51 to Gly-56.			AR061: 1, AR089: 0 S0260: 2		
HSDIZ79	647239	1741	7 - 132	5065			Ala-2 to Asn-32.			S0031: 1 and S0260: 1.		
HSDJA26	681594	1742	104 - 286	5066			Arg-20 to Asn-31.			S0031: 1 and S0260: 1.		
HSDJB42	866729	1743	244 - 402	5067						H0052: 2, L0438: 1 and S0260: 1.		
HSDJC13	958545	1744	2 - 373	5068			Thr-56 to Ala-61.			S0222: 1, S0388: 1 and S0260: 1.		
HSDJC77	772102	1745	501 - 632	5069			Lys-5 to Thr-12, Pro-25 to Lys-30.			S6024: 1, L0756: 1 and S0260: 1.		
HSDJD58	470780	1746	1 - 213	5070			Ile-2 to Asn-8.			S0010: 1 and S0260: 1.		
HSDJH13	657110	1747	124 - 285	5071						S0346: 1 and S0260: 1.		
HSDJJ34	703988	1748	306 - 542	5072			Pro-6 to Ser-11.			L0439: 2, L0424: 1, S0222: 1, L0805: 1, S0260: 1 and L0366: 1.		
HSDJL30	666329	1749	108 - 293	5073			Pro-31 to Thr-37.			S0260: 2		
HSDJL32	699175	1750	111 - 416	5074						S0036: 1 and S0260: 1.		

HSDJN61	866700	1751	579 - 1055	5075	Pro-1 to Gly-8, Phe-16 to Leu-22, Pro-26 to His-35, Ala-37 to Arg-43, Gln-56 to Trp-75, Ser-120 to Ala-125, Asn-130 to Arg-142.	AR051: 27, AR054: 26, AR050: 21 S0282: 1 and S0260: 1.		
HSDJO75	767243	1752	252 - 368	5076	Thr-1 to Asp-9, Gly-28 to Thr-35.	S0010: 1 and S0260: 1.		
HSDJT90	787310	1753	8 - 241	5077	Glu-22 to Gly-37.	S0031: 1 and S0260: 1.		
HSDJX59	739195	1754	238 - 453	5078		S0031: 1 and S0260: 1.		
HSDJX78	729527	1755	327 - 614	5079	Trp-2 to His-11, Ser-42 to Phe-51.	S0260: 2		
HSDKA33	702331	1756	61 - 282	5080	Lys-1 to Ser-17, Pro-38 to Leu-44.	S0031: 1 and S0260: 1.		
HSDKD04	470794	1757	3 - 263	5081	Pro-63 to Arg-69.	S0222: 1, S0010: 1, L0747: 1, L0756: 1 and S0260: 1.		
HSDKD35	716525	1758	3 - 368	5082	Glu-104 to Leu-109.	S0260: 2		
HSDKD43	972452	1759	196 - 426	5083	Trp-1 to Ser-7, Ile-9 to Thr-17, Glu-55 to Gly-60.	S0260: 2		
HSDKE51	725608	1760	1 - 327	5084	Pro-1 to Arg-9, Thr-14 to Asp-21, Val-34 to Gly-39.	S0260: 2		
HSDKF68	959685	1761	192 - 422	5085	Phe-28 to Met-45.	S0031: 1 and S0260: 1.		
HSDKF80	751976	1762	2 - 268	5086		AR089: 0, AR061: 0 S0050: 1 and S0260: 1.		

HSDKI10	921371	1763	555 - 349	5087			L0438: 2, L0439: 2, H0064: 1 and S0260: 1.		
HSDMA43	573640	1764	3 - 314	5088	Asn-62 to Asn-67.		H0009: 2 and H0400: 1.	20q11	
HSDMD03	924732	1765	92 - 226	5089	Lys-1 to Tyr-7, His-32 to Tyr-38.		H0400: 2		
HSDSA69	754203	1766	51 - 158	5090			H0409: 2		
HSDSC67	588381	1767	283 - 417	5091	Ser-6 to Gln-11.		H0409: 2		
HSDXA53	576527	1768	151 - 270	5092	Ser-19 to Gln-24.		H0442: 2 and L0471: 1.		
HSDZB17	576116	1769	129 - 329	5093	Arg-13 to Gln-19.		H0455: 2, L0769: 2, L0564: 1 and L0763: 1.		
HSDZJ50	578170	1770	216 - 368	5094	Arg-1 to Glu-13, Arg-16 to Asn-25.		H0455: 1, T0082: 1, L0109: 1, L0770: 1, L0634: 1, L0748: 1, L0747: 1, L0749: 1 and L0752: 1.		
HSDZM75	582205	1771	190 - 300	5095	Ser-4 to Ser-10.		H0455: 1 and S0036: 1.		
HSDZQ79	757666	1772	329 - 90	5096	Pro-20 to Tyr-35.		H0455: 1 and H0052: 1.		
HSXAM81	746717	1773	6 - 230	5097			L0361: 2, S0036: 1 and S0031: 1.		
HSXAM95	529482	1774	1 - 129	5098			S0036: 2		
HSXAP03	925318	1775	164 - 352	5099	Glu-32 to Asn-39, Arg-45 to Gln-54.		L0439: 6, S0222: 1, S0036: 1 and L0438: 1.	5q31	121050, 131400, 138040, 153455, 159000,

HSXAS81	542423	1776	157 - 273	5100				179095, 181460, 192974, 192974, 600807, 601596, 601692, 601692, 601692, 601692, 602089, 602121, 602460
HSXAW13	723639	1777	1 - 252	5101	Ser-52 to Trp-61, Pro-66 to Asn-76.		S0036: 3 S0036: 2	
HSXAW48	887841	1778	83 - 457	5102	Leu-7 to Pro-17, Gly-37 to Glu-44, His-89 to Gly-95.	AR051: 736, AR054: 534, AR050: 481 S0036: 3		
HSXAY20	669894	1779	73 - 192	5103	Pro-25 to Tyr-40.	S0036: 2		
HSXBB45	955709	1780	548 - 381	5104	Val-10 to Val-24.	L0750: 2, L0759: 2, S0010: 1, S0036: 1, L0803: 1 and L0779: 1.		
HSXBD84	526818	1781	1 - 432	5105		S0036: 3		
HSXBL12	524779	1782	69 - 200	5106		S0036: 2		
HSXBN54	530315	1783	2 - 91	5107		S0010: 1 and S0036: 1.		
HSXBQ42	954602	1784	54 - 179	5108		S0049: 1 and S0036: 1.		
HSXBR16	584914	1785	6 - 104	5109		S0036: 2		

HSXBR83	574542	1786	196 - 336	5110	Glu-26 to Trp-34, Thr-36 to Leu-42.	S0036: 2		
HSXBBS18	666851	1787	24 - 242	5111		S0282: 1 and S0036: 1.		
HSXBBV75	886567	1788	1 - 687	5112	Asp-20 to Leu-26, Pro-55 to Gln-63, Glu-120 to Pro-130, Tyr-160 to Arg-181.	AR054: 10, AR061: 4, AR050: 2, AR089: 1 S0038: 2, S0036: 1 and L0681: 1.		
HSXCB49	800501	1789	459 - 85	5113		AR051: 6, AR061: 1, AR089: 0 S0036: 2		
	909820	3254	40 - 273	6578	Lys-7 to His-19.			
HSXCI41	574835	1790	86 - 361	5114	Leu-11 to Trp-16, Pro-47 to Gly-59.	L0157: 2, S0036: 2, S0110: 1, H0406: 1, L0770: 1 and L0794: 1.		
HSXCI52	966403	1791	311 - 601	5115		S0282: 1 and S0036: 1.		
HSXCJ24	887840	1792	3 - 290	5116	His-1 to Pro-16, Thr-40 to Cys-47.	S0036: 1 and S0386: 1.		
HSXCP50	703885	1793	83 - 208	5117		S6024: 1 and S0036: 1.		
HSXCQ76	575031	1794	2 - 349	5118	Lys-1 to Thr-6, Lys-17 to Lys-23, Glu-31 to Asn-36, Gly-51 to Lys-56, Pro-90 to Lys-96.	H0052: 1 and S0036: 1.		
HSXCR71	573402	1795	65 - 223	5119		S0036: 2, L0521: 1 and L0599: 1.		
HSXCU20	574581	1796	1 - 75	5120	Glu-1 to Arg-10.	S0036: 2		
HSXCU65	841989	1797	1 - 189	5121	Pro-24 to Cys-29, Gln-40 to Glu-49.	S0036: 2		

HSXCU78	573405	1798	158 - 310	5122			S0036: 2		
HSXCV16	662122	1799	3 - 275	5123			H0009: 1 and S0036: 1.		
HSXCV27	683584	1800	567 - 749	5124	Phe-3 to Glu-12.		S0010: 1, S0346: 1 and S0036: 1.		
HSXCW03	575102	1801	1 - 57	5125			S0036: 2		
HSXCW86	526461	1802	879 - 598	5126			L0439: 5, L0438: 4, H0123: 1, T0010: 1 and S0036: 1.		
HSXCX56	573379	1803	1 - 144	5127			S0036: 2		
HSXCX64	573383	1804	1 - 312	5128	Ser-8 to Asn-22.		S0036: 2		
HSXCY23	573394	1805	87 - 191	5129	Lys-5 to Trp-10.		S0036: 2		
HSXDI57	573376	1806	26 - 130	5130	Tyr-1 to Ser-11.		S0036: 2		
HSXEA49	722633	1807	209 - 370	5131	Ile-10 to Thr-15.		S0036: 2 and L0773: 1.		
HSXEB43	871034	1808	299 - 559	5132	Thr-16 to Asn-24.		L0438: 2, L0439: 2, S6028: 1, S0036: 1 and L0592: 1.		
HSXED85	871026	1809	67 - 171	5133	Lys-30 to Gln-35.		S0036: 2		
HSXEH51	871027	1810	18 - 386	5134	Pro-9 to Thr-16, His-28 to Arg-50, Ile-79 to Trp-89, Pro-92 to Gly-104, Leu-116 to Lys-123.		S0036: 1, S0386: 1 and L0366: 1.		
HSXEL05	835786	1811	252 - 458	5135			H0051: 1, S0036: 1 and L0756: 1.		
HSXEM67	954228	1812	228 - 410	5136	Tyr-56 to Ile-61.		H0052: 1, S0036: 1, L0764: 1, L0776: 1 and L0657: 1.		
HSXEN69	754732	1813	81 - 269	5137	Pro-7 to His-14.		S0222: 1 and S0036: 1.		

HSXFF71	760063	1814	34 - 273	5138	Arg-44 to Ser-51, Glu-53 to Glu-59.	S0036: 2		
HSXFG04	927400	1815	307 - 2	5139		H0052: 1 and S0036: 1.		
HSXFL85	943733	1816	52 - 525	5140	Phe-14 to Gly-27, Thr-56 to Cys-80, His-82 to Pro-90, Glu-141 to His-147.	AR089: 4, AR061: 3 S0222: 2, H0572: 1, S0036: 1, L0741: 1, L0742: 1 and L0780: 1.		
HSXFO21	670459	1817	89 - 310	5141	Ala-11 to Gly-20.	H0009: 1 and S0036: 1.4p16.3	134934, 134934, 134934, 134934, 134934, 143100, 180072, 180072, 194190, 252800, 252800, 252800, 600965	
HSXFAQ06	934825	1818	27 - 221	5142	Thr-26 to Leu-35, Pro-39 to Ala-44.	S0282: 1 and S0036: 1.		
HSXFS48	871006	1819	60 - 272	5143	Pro-25 to Thr-30, Thr-41 to Lys-46, Gly-55 to Ser-61.	S0036: 2		
HTLGP15	880297	1820	189 - 662	5144	Gly-2 to Thr-10, Glu-99 to Gly-104.	AR089: 4, AR061: 3 T0010: 3, S0049: 2, H0052: 2, L0415: 1, H0618: 1 and S0010: 1.		

HSXGH60	871004	1821	84 - 356	5145			S0036: 1 and L0523: 1.		
HSXFU74	765201	1822	125 - 430	5146			S0036: 1 and L0601: 1.		
HSXFT49	722605	1823	167 - 454	5147		Glu-12 to Pro-24, Arg-38 to Gly-45.	L0759: 3, S0036: 1, L0743: 1 and L0747: 1.		
HSXFP61	741435	1824	216 - 377	5148			L0439: 7 and S0036: 1.		
HSXFK91	789985	1825	220 - 420	5149		Ile-18 to Asn-24.	S0036: 1 and L0753: 1.		
HSXET41	711993	1826	301 - 465	5150			L0605: 4, L0600: 2, S0036: 1, L0766: 1, L0655: 1 and L0758: 1.		
HSXET34	703662	1827	426 - 211	5151			L0794: 6, L0747: 2, S0036: 1, L0769: 1, L0771: 1, L0767: 1, L0775: 1, L0383: 1, L0790: 1 and L0602: 1.		
HSXET23	675536	1828	299 - 427	5152		Ala-24 to Leu-32.	S0036: 1, L0500: 1, L0784: 1 and L0740: 1.		
HSXES92	790725	1829	266 - 436	5153		Asn-8 to Lys-16.	L0439: 4 and S0036: 1.		
HSXER67	751279	1830	30 - 128	5154		Gln-1 to Trp-16, Asn-19 to Thr-24.	S0036: 1 and L0756: 1.		
HSXEQ03	923358	1831	175 - 348	5155			S0036: 1 and L0766: 1.		
HSXEP49	722563	1832	85 - 339	5156		Pro-6 to Gly-25.	L0755: 2, S0036: 1, L0806: 1, L0754: 1 and L0780: 1.		
HSXEM22	673999	1833	2 - 439	5157			S0036: 1, L0750: 1 and L0731: 1.		
HSXEK94	861785	1834	261 - 530	5158		Thr-49 to Gly-57, Asn-61 to Glu-73.	S0036: 1 and L0748: 1.		
HSXEK82	779045	1835	39 - 254	5159		Gly-12 to Pro-26,	S0036: 1 and L0439: 1.		

HSXEC47	719955	1836	137 - 406	5160	Thr-29 to Trp-45.	L0748: 2 and S0036: 1.		
HSXDG96	796494	1837	275 - 403	5161	Glu-5 to Pro-13, Thr-29 to Met-35.	S0036: 1 and L0777: 1.		
HSXDA85	784436	1838	2 - 148	5162	Pro-1 to Asp-11.	S0036: 1 and L0361: 1.		
HSXCZ43	573398	1839	75 - 158	5163		S0036: 1		
HSXCZ21	671139	1840	245 - 343	5164	Thr-1 to Lys-8.	S0036: 1 and L0748: 1.		
HSXCW61	573396	1841	1 - 108	5165	Arg-3 to Glu-10, Arg-28 to Pro-36.	S0036: 1		
HSXCV53	572956	1842	2 - 136	5166		S0036: 1		
HSXCV44	573406	1843	3 - 95	5167		S0036: 1		
HSXCV41	572957	1844	30 - 263	5168	Pro-25 to Lys-38, His-50 to Gly-55.	S0036: 1		
HSXCT69	573393	1845	15 - 206	5169	Gln-1 to Asp-14.	S0036: 1		
HSXCT62	753992	1846	13 - 129	5170		S0036: 1		
HSXCT27	683594	1847	3 - 179	5171	Asn-42 to Gly-47.	S0036: 1		
HSXCS03	924746	1848	300 - 503	5172	Trp-62 to Lys-68.	L0769: 2, L0622: 1, S0036: 1, L0770: 1 and L0803: 1.		
HSXCR64	572958	1849	83 - 226	5173		S0036: 1		
HSXCN89	787016	1850	36 - 137	5174		S0036: 1 and L0748: 1.		
HSXCM50	724556	1851	95 - 202	5175		L0604: 3, L0766: 2, S0036: 1, L0772: 1 and L0774: 1.		
HSXCM06	935859	1852	99 - 203	5176	Ser-1 to Arg-11.	S0036: 1		
HSXBZ26	574531	1853	1 - 84	5177		S0036: 1		
HSXBX92	792899	1854	247 - 360	5178		S0036: 1 and L0748: 1.		
HSXBW80	574533	1855	95 - 235	5179		S0036: 1		

HSXBW72	835633	1856	66 - 245	5180	Ile-54 to Ala-59.	S0036: 1		
HSXBW60	574540	1857	89 - 262	5181	Trp-1 to Gly-10, Arg-15 to Pro-24, Leu-39 to Phe-50.	S0036: 1		
HSXBW55	574538	1858	1 - 147	5182	Lys-29 to Phe-37.	S0036: 1		
HSXBW43	574539	1859	90 - 209	5183	Lys-1 to Ser-9.	S0036: 1		
HSXBW24	523014	1860	1 - 72	5184	Arg-1 to Asp-11, Leu-16 to Pro-24.	S0036: 1		
HSXBU01	921428	1861	197 - 328	5185		S0036: 1 and L0594: 1.		
HSXBS08	959975	1862	58 - 192	5186		L0623: 1 and S0036: 1. 13q14	109543, 600631, 601499	
HSXBO29	689842	1863	367 - 495	5187		L0756: 2 and S0036: 1.		
HSXBN74	765421	1864	2 - 223	5188		S0036: 1		
HSXBN53	765475	3255	762 - 526	6579	Thr-1 to Asn-9.			
HSXBN53	728370	1865	217 - 384	5189		S0036: 1 and L0766: 1.		
HSXBL64	746976	1866	173 - 370	5190	Asn-1 to Leu-8.	L0777: 2, S0036: 1 and L0756: 1.		
HSXBL02	920745	1867	54 - 146	5191	Val-7 to Ser-14.	S0036: 1 and L0756: 1.		
HSXBK90	789143	1868	222 - 509	5192	Met-8 to Pro-13, Pro-38 to Trp-44, Leu-85 to Thr-90.	L0439: 2 and S0036: 1. 20p13-p12.1	192340, 234200	
HSXB183	603042	1869	417 - 160	5193	Ala-36 to Pro-49, Ala-65 to Glu-72.	S0036: 1		
HSXBD96	796554	1870	164 - 439	5194	Pro-26 to Pro-31.	L0754: 2 and S0036: 1.		
HSXBD03	924951	1871	281 - 445	5195		L0770: 5, S0036: 1 and L0764: 1.		
HSXBC89	887955	1872	3 - 134	5196		AR051: 14		

HSXAW11	894180	1873	2 - 382	5197	Pro-1 to Arg-6, Asn-11 to Thr-16, Glu-65 to Phe-71, Tyr-117 to Gly-127.	S0036: 1 L0766: 2 and S0036: 1.	16p11.2	147781, 172471, 182381
HSXAJ56	733686	1874	49 - 201	5198	Lys-6 to Asp-13.	L0754: 4 and S0036: 1.		
HSXAG23	676380	1875	260 - 472	5199	Arg-18 to Trp-31.	S0036: 1, L0809: 1 and L0740: 1.		
HSDZQ65	866657	1876	1 - 207	5200	Ser-1 to Arg-12, Gln-27 to Gly-37, Ala-41 to Ser-47.	H0455: 1		
HSDZP19	866656	1877	245 - 502	5201	Ser-32 to Gln-38.	L0439: 2, H0455: 1 and L0438: 1.		
HSDZO24	677063	1878	75 - 197	5202		H0455: 1 and L0744: 1.	12p11	
HSDZN27	682946	1879	121 - 462	5203		L0754: 4, L0438: 3, L0777: 3, H0455: 1, L0439: 1 and L0731: 1.		
HSDZM86	785399	1880	42 - 170	5204		H0455: 1 and L0439: 1.		
HSDZE46	718964	1881	221 - 442	5205	Asn-1 to Asp-6, Asn-41 to Tyr-46.	H0455: 1, L0439: 1 and L0592: 1.		
HSDZD56	746515	1882	32 - 319	5206	Ala-17 to Arg-24, Tyr-32 to Asp-38, Val-79 to Cys-86.	H0455: 1 and L0758: 1.		
HSDSF36	588388	1883	147 - 323	5207	Pro-20 to Phe-27.	L0748: 2, H0409: 1 and L0749: 1.		
HSDSB34	866675	1884	39 - 398	5208	Phe-1 to Leu-6,	H0409: 1		

HSDMA06	938590	1885	217 - 513	5209	Cys-87 to Ser-94.	H0400: 1, L0438: 1 and L0439: 1.		
HSDKK78	773510	1886	352 - 567	5210	Trp-2 to Ser-11, Gly-24 to Ser-37.	L0439: 2 and S0260: 1.		
HSDKK73	761688	1887	1 - 252	5211	Leu-10 to His-22, Lys-36 to Lys-41.	L0748: 1 and S0260: 1.		
HSDKF26	582267	1888	22 - 423	5212	Asp-65 to Ala-70.	AR061: 2, AR089: 1 S0260: 1		
HSDKE47	764970	1889	1 - 297	5213	Asn-42 to Gly-47, Lys-55 to Ala-62.	AR089: 15, AR061: 6 S0260: 1 and L0581: 1.	104770, 107300, 107670, 131210, 134638, 136132, 145001, 146740, 146740, 146740, 146790, 173610, 176310, 186780, 191030, 227400, 227400, 601412, 601652, 602491	

HSDJR26	583611	1890	500 - 685	5214			S0260: 1		
HSDJP51	725609	1891	3 - 122	5215			L0803: 1, L0438: 1, L0439: 1, L0750: 1, L0777: 1 and S0260: 1.		
HSDJI17	663374	1892	88 - 396	5216		Pro-4 to Gly-11, Ala-19 to Leu-25, Gln-93 to Gly-103.	L0766: 1 and S0260: 1.		
HSDJI15	901056	1893	2 - 454	5217		Lys-8 to Ser-14, Pro-28 to Ser-33, Ser-51 to Ala-57, Thr-84 to Pro-97, Lys-119 to Pro-130, Asn-134 to Arg-147.	AR051: 13, AR054: 2, AR050: 1 S0260: 1		
HSDJH47	720227	1894	246 - 464	5218		Val-64 to Ala-71.	L0745: 2, L0766: 1, L0659: 1, L0666: 1 and S0260: 1.		
HSDJH06	866723	1895	123 - 344	5219		Gln-8 to Val-20.	S0260: 1		
	933254	3256	299 - 90	6580					
HSDJD10	949201	1896	10 - 135	5220			L0748: 1, L0745: 1 and S0260: 1.		
HSDJC48	721581	1897	371 - 523	5221			S0260: 1 and L0608: 1.		
HSDJC11	966885	1898	307 - 543	5222		Lys-14 to Ala-23, Pro-25 to Arg-33.	L0779: 1 and S0260: 1.		
HSDIY29	871386	1899	114 - 449	5223			L0748: 1 and S0260: 1.		
HSDIX14	658095	1900	145 - 390	5224		Thr-31 to Pro-37.	L0776: 3, L0005: 2, L0809: 2, L0626: 1, L0777: 1 and S0260: 1.		
HSDI129	690542	1901	276 - 440	5225		Asp-19 to Thr-26.	S0260: 1		

HSDII10	748241	1902	17 - 457	5226	His-8 to Gly-18, Asp-129 to Leu-134, Gly-139 to Gly-146.	AR051: 2, AR050: 2, AR054: 1 S0260: 1		
	963460	3257	3 - 374	6581	Asp-106 to Leu-111, Gly-116 to Gly-123.			
	963924	3258	281 - 57	6582	Arg-1 to Ser-6, Ser-41 to Cys-58, Gly-68 to Ser-75.			
	963925	3259	693 - 1043	6583	Ser-1 to Gly-7, Arg-42 to Gln-50.			
HSDIC30	866739	1903	225 - 392	5227	Gly-3 to Trp-10, Glu-22 to Gln-30, Ala-51 to Gln-56.	L0769: 1 and S0260: 1.		
HSDIC27	682289	1904	360 - 632	5228		L0438: 4, L0439: 3 and S0260: 1.		
HSDGX96	796401	1905	98 - 229	5229	Ala-21 to Met-26, Ser-36 to Gly-41.	S0031: 1 and L0605: 1.		
HSDGV15	659535	1906	112 - 240	5230		L0598: 1, L0744: 1, L0748: 1 and S0031: 1.		
HSDGT91	790221	1907	1 - 138	5231		S0031: 1		
HSDGQ74	765599	1908	231 - 431	5232	Gly-1 to Trp-9, Phe-13 to Lys-25, Lys-61 to Lys-66.	L0439: 2 and S0031: 1.		
HSDGP11	967096	1909	64 - 255	5233		L0748: 1 and S0031: 1.		
HSDFY29	888445	1910	124 - 495	5234	Thr-1 to Asn-8.	AR051: 41, AR054: 28, AR050: 27 S0031: 1		
HSDFX20	668910	1911	82 - 348	5235	Cys-3 to Pro-15,	L0773: 1, L0766: 1,		

						Pro-17 to Leu-25, Pro-50 to Asp-60, Lys-74 to Lys-79.	L0783: 1, L0809: 1, L0745: 1 and S0031: 1.		
HSDFU92	792735	1912	134 - 382	5236		Asp-1 to Ser-20, Glu-42 to Arg-47, Gln-55 to Lys-61, Leu-65 to Gly-76.	S0031: 1		
HSDFU69	757598	1913	95 - 337	5237		Glu-3 to Asp-8, Ser-27 to Leu-35, Pro-65 to Ser-73.	S0031: 1		
HSDFU57	734805	1914	1 - 225	5238		Arg-26 to Val-33, Ala-46 to Gly-60.	S0031: 1		
HSDFT51	947918	1915	1 - 591	5239		Ala-155 to Glu-160.	AR061: 6, AR089: 3 L0618: 1, L0770: 1, L0803: 1 and S0031: 1.		
HSDFT26	866760	1916	291 - 509	5240		Gly-1 to Leu-9, Pro-13 to Glu-20, Leu-36 to Ser-42.	L0745: 1 and S0031: 1.		
HSDFS40	711223	1917	1 - 342	5241		Asp-23 to Arg-30, His-39 to Thr-46, Gly-96 to Pro-109.	S0031: 1 and L0592: 1.		
HSDFS12	970744	1918	120 - 308	5242			L0542: 1 and S0031: 1.		
HSDFL73	572661	1919	1 - 165	5243		Gly-1 to Asn-8.	L0439: 3, L0747: 3, L0742: 1, L0731: 1 and S0031: 1.		
HSDFF18	885456	1920	31 - 330	5244		His-8 to Gly-18, Pro-81 to Thr-88.	S0031: 1		
HSDFD71	760471	1921	89 - 304	5245		Tyr-40 to Arg-49.	L0439: 4 and S0031: 1.		

HSDFD06	935774	1922	98 - 229	5246	Lys-31 to Leu-43.	L0754: 1 and S0031: 1.		
HSDFC77	888325	1923	3 - 335	5247	Arg-16 to Leu-21.	AR051: 20, AR054: 14, AR050: 11 S0031: 1		
HSDFB32	623853	1924	215 - 3	5248	Thr-56 to Arg-71.	AR050: 6, AR051: 2, AR054: 1 S0031: 1		
HSDFFA59	578735	1925	21 - 293	5249	Gln-44 to Thr-52.	S0031: 1		
HSDEV19	842146	1926	159 - 359	5250	Lys-47 to Thr-52.	S0031: 1		
HSDEU27	866776	1927	67 - 321	5251		L0439: 1 and S0031: 1.		
HSDEU06	935736	1928	13 - 231	5252	Ser-7 to Gly-15, Ala-21 to Thr-38.	S0031: 1		
HSDEH30	692826	1929	403 - 558	5253	Ala-30 to Pro-35, Ala-44 to Asn-49.	L0748: 1 and S0031: 1.		
HSDEH43	751768	1930	124 - 318	5254	Tyr-21 to Tyr-28.	L0439: 2, L0756: 1 and S0031: 1.	9q31	109400, 132800, 132800, 186855, 223900, 253800, 253800, 278700, 602088
HSDEH39	705540	1931	369 - 527	5255		L0439: 2, L0766: 1, L0740: 1, L0777: 1 and S0031: 1.	6q24	107470, 107470, 107470, 164200, 164200, 254780,